

Drying Tumblers

Stacked 30 Pound Capacity

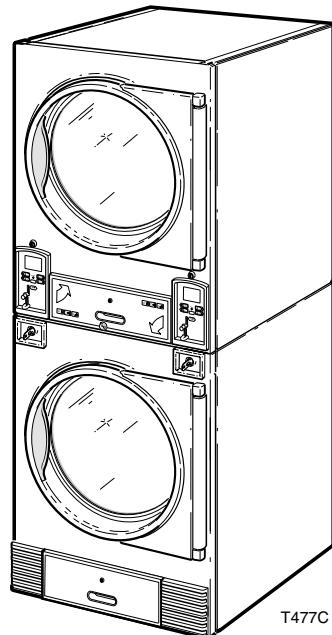
Stacked 45 Pound Capacity

Starting Serial No. 0602004144

Refer to Page 4 for Model Identification



NOTA: Para bajar una copia de estas instrucciones en español, visite www.comlaundry.com.



Keep These Instructions for Future Reference.

(If this machine changes ownership, this manual must accompany machine.)



www.comlaundry.com

Part No. 70304601R8
September 2008

Installation

Installation must conform with local codes or in the absence of local codes with:

In the U.S.A., installation must conform to the latest edition of the American National Standard Z223.1/NFPA 54 "National Fuel Gas Code" and Standard ANSI/NFPA 70 "National Electric Code."

In Canada, installation must comply with Standards CAN/CSA-B149.1 or Natural Gas and Propane Installation Code and CSA C22.1, latest edition, Canadian Electric Code, Part I.

In Australia, installation must comply with the Australian Gas Association Installation Code for Gas Burning Appliances and Equipment.

	WARNING		MISE EN GARDE
	<p>FOR YOUR SAFETY, the information in this manual must be followed to minimize the risk of fire or explosion or to prevent property damage, personal injury or death.</p> <p style="text-align: right;">W033</p> <ul style="list-style-type: none">• Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.• WHAT TO DO IF YOU SMELL GAS:<ul style="list-style-type: none">– Do not try to light any appliance.– Do not touch any electrical switch; do not use any phone in your building.– Clear the room, building or area of all occupants.– Immediately call your gas supplier from a neighbor's phone. Follow the gas supplier's instructions.– If you cannot reach your gas supplier, call the fire department.• Installation and service must be performed by a qualified installer, service agency or the gas supplier. <p style="text-align: right;">W052</p>		<p>POUR VOTRE SÉCURITÉ, les informations de ce guide doivent être respectées afin de réduire les risques d'incendie, d'explosion ou d'éviter les dommages matériels, personnels ou blessures mortelles.</p> <p style="text-align: right;">W033R3QU</p> <ul style="list-style-type: none">• Ne pas entreposer ou utiliser d'essence ou toutes autres vapeurs et liquides inflammables à proximité de cette machine ou de tout autre appareil.• QUE FAIRE EN CAS D'ODEUR DE GAZ :<ul style="list-style-type: none">– Ne pas mettre d'appareil en marche.– Ne pas toucher aux interrupteurs électriques ; ne pas utiliser le téléphone des lieux.– Évacuer la pièce, le bâtiment ou la zone de tous les occupants.– Appeler immédiatement le fournisseur de gaz de la maison d'un voisin. Respecter les instructions communiquées par le fournisseur.– Si vous ne pouvez pas joindre le fournisseur de gaz, appeler le service d'incendie.• L'installation et l'entretien doivent être effectués par un installateur, service d'entretien qualifiés ou par le fournisseur de gaz. <p style="text-align: right;">W052R5QU</p>
	<p>FOR YOUR SAFETY</p> <p>Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.</p> <p style="text-align: right;">W053</p>		<p>POUR VOTRE SÉCURITÉ</p> <p>Ne pas entreposer ou utiliser d'essence ou toutes autres vapeurs et liquides inflammables à proximité de cette unité ou de tout autre appareil.</p> <p style="text-align: right;">W053R2QU</p>

The following information applies to the state of Massachusetts, USA.

- This appliance can only be installed by a Massachusetts licensed plumber or gas fitter.
- This appliance must be installed with a 36 inch (91 cm) long flexible gas connector.
- A "T-Handle" type gas shut-off valve must be installed in the gas supply line to this appliance.
- This appliance must not be installed in a bedroom or bathroom.

IMPORTANT: Information must be obtained from a local gas supplier on instructions to be followed if the user smells gas. These instructions must be posted in a prominent location. Step-by-step instructions of the above safety information must be posted in a prominent location near the tumbler for customer use.

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Introduction

Model Identification

Information in this manual is applicable to these models:

	Gas	Steam	Electric
T30	CHD30STG2-CAT30L	IPD30STG2-ITT30L	CHD30STS2-CTT30S
	CHD30STG2-CAT30N	IPD30STG2-ITT30N	CHD30STS2-CUT30S
	CHD30STG2-CTT30L	MTT30N	DRST30S2-BTT30S
	CHD30STG2-CTT30N	NTT30N	DRST30S2-BUT30S
	CHD30STG2-CUT30L	SAT30L	HTT30S
	CHD30STG2-CUT30N	SAT30N	HUT30S
	DRST30G2-BAT30L	STT30D	IPD30STS2-ITT30S
	DRST30G2-BAT30N	STT30L	STT30S
	DRST30G2-BTT30D	STT30N	SUT30S
	DRST30G2-BTT30L	SUT30L	UTT30S
	DRST30G2-BTT30N	SUT30N	UUT30S
	DRST30G2-BUT30L	UAT30L	
	DRST30G2-BUT30N	UAT30N	
	HAT30L	UTT30L	
	HAT30N	UTT30N	
	HTT30D	UUT30L	
	HTT30L	UUT30N	
	HTT30N		
	HUT30L		
	HUT30N		
T45	CTT45L	MTT45N	
	CTT45N	NTT45N	
	DRST45G2-BTT45D	STT45D	
	DRST45G2-BTT45L	STT45L	
	DRST45G2-BTT45N	STT45N	
	HTT45D	SUT45L	Not Applicable
	HTT45L	SUT45N	
	HTT45N	UTT45L	
	HUT45L	UTT45N	
	HUT45N		
	IPD45STG2-ITT45L		
	IPD45STG2-ITT45N		

Includes models with control suffixes:

3O– DX4 OPL	NC– NetMaster coin	SX– single drop, prep for coin
3V– DX4 vended	NR– NetMaster card	ZC– NetMaster network coin
3X– DX4 prep for coin	NX– NetMaster, prep for coin	ZR– NetMaster network card
BC– basic electronic, coin	NY– NetMaster, prep for card	ZX– NetMaster network, prep for coin
BL– basic electronic, central pay	OM– OPL micro	ZY– NetMaster network, prep for card
BX– basic electronic, prep for coin	QT– dual digital timer	
BY– basic electronic, prep for card	SD– single drop	

Customer Service

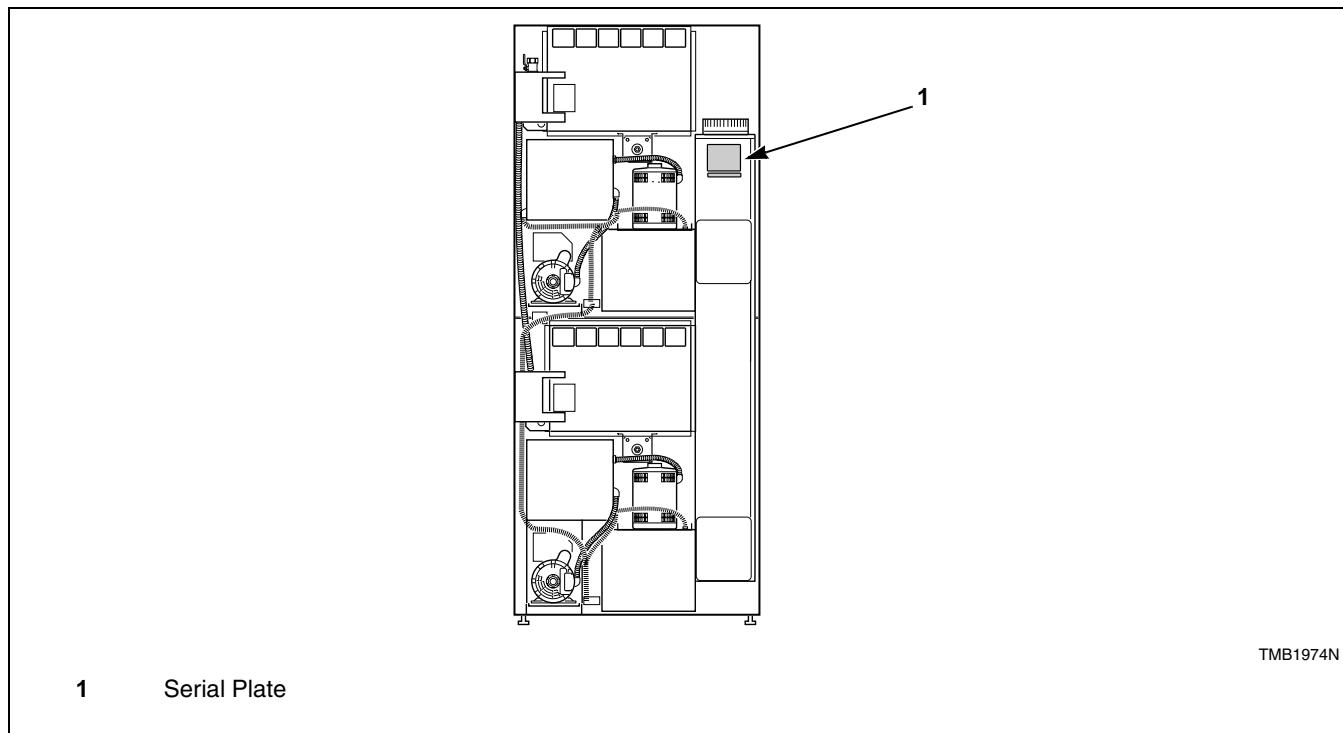
If literature or replacement parts are required, contact the source from which the machine was purchased or contact Alliance Laundry Systems at (920) 748-3950 for the name and address of the nearest authorized parts distributor.

For technical assistance, call (920) 748-3121.

Wiring Diagram

The wiring diagram is located in the upper junction or upper contactor box.

The wiring diagram part number is located in the lower portion of the electrical data on the serial plate.



Conversion Table

Multiply	By	To Obtain		Multiply	By	To Obtain
Btu	0.252	kCal		Pounds/sq. inch	0.06895	Bars
Btu	1055	Joules		Pounds/sq. inch	0.070	kg/sq. cm
Inch	25.4	Millimeters		Pounds (lbs.)	0.454	Kilograms
Inches W.C.	0.036	Pounds/sq. inch		Boiler Horsepower	33,479	Btu/hr.
Inches W.C.	0.249	kPa		Boiler Horsepower	34.5	lbs. steam/hr.
lb/inch ² (psi)	6.895	kPa		CFM	0.471	liters/second
ft ³	28.32	Liters		kW	3414	Btu/hr.

Safety Information

Explanation of Safety Messages

Precautionary statements ("DANGER," "WARNING," and "CAUTION"), followed by specific instructions, are found in this manual and on machine decals. These precautions are intended for the personal safety of the operator, user, servicer, and those maintaining the machine.

	DANGER
Indicates an imminently hazardous situation that, if not avoided, will cause severe personal injury or death.	

	WARNING
Indicates a hazardous situation that, if not avoided, could cause severe personal injury or death.	

	CAUTION
Indicates a hazardous situation that, if not avoided, may cause minor or moderate personal injury or property damage.	

Additional precautionary statements ("IMPORTANT" and "NOTE") are followed by specific instructions.

IMPORTANT: The word "IMPORTANT" is used to inform the reader of specific procedures where minor machine damage will occur if the procedure is not followed.

NOTE: The word "NOTE" is used to communicate installation, operation, maintenance or servicing information that is important but not hazard related.

	WARNING
Failure to install, maintain, and/or operate this machine according to manufacturer's instructions may result in conditions which can produce serious injury, death and/or property damage.	

W051R1

NOTE: The WARNING and IMPORTANT instructions appearing in this manual are not meant to cover all possible conditions and situations that may occur. It must be understood that common sense, caution and carefulness are factors which CANNOT be built into this tumbler. These factors MUST BE supplied by the person(s) installing, maintaining or operating the tumbler.

Always contact your dealer, distributor, service agent or the manufacturer on any problems or conditions you do not understand.

Important Safety Instructions

Save These Instructions



WARNING

Hazardous Voltage. Can cause shock, burn or cause death. Allow machine power to remain off for two minutes prior to working in and around AC inverter drive.

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1. Read all instructions before using the tumbler.
2. Refer to the **GROUNDING INSTRUCTIONS** for the proper grounding of the tumbler.
3. Do not dry articles that have been previously cleaned in, washed in, soaked in, or spotted with gasoline, dry cleaning solvents, other flammable or explosive substances as they give off vapors that could ignite or explode.
4. Do not allow children on or in the tumbler. This appliance is not intended for use by young children or infirm persons without supervision. Young children should be supervised to ensure that they do not play with the appliance.
5. Before the tumbler is removed from service or discarded, remove the door to the drying compartment and the door to the lint compartment.
6. Do not reach into the tumbler if the cylinder is revolving.
7. Do not install or store the tumbler where it will be exposed to water and/or weather.
8. Do not tamper with the controls.
9. Do not repair or replace any part of the tumbler, or attempt any servicing unless specifically recommended in the user-maintenance instructions or in published user-repair instructions that you understand and have the skills to carry out.
10. Do not use fabric softeners or products to eliminate static unless recommended by the manufacturer of the fabric softener or product.
11. To reduce the risk of fire, **DO NOT DRY** plastics or articles containing foam rubber or similarly textured rubberlike materials.
12. Always clean the lint filter daily.
13. Keep area around the exhaust opening and adjacent surrounding area free from the accumulation of lint, dust and dirt.

14. The interior of the tumbler and the exhaust duct should be cleaned periodically by qualified service personnel.
15. If not installed, operated and maintained in accordance with the manufacturer's instructions or if there is damage to or mishandling of this product's components, use of this product could expose you to substances in the fuel or from fuel combustion which can cause death or serious illness and which are known to the State of California to cause cancer, birth defects or other reproductive harm.
16. Tumbler will not operate with the loading door open. **DO NOT** bypass the door safety switch to permit the tumbler to operate with the door open. The tumbler will stop tumbling when the door is opened. Do not use the tumbler if it does not stop tumbling when the door is opened or starts tumbling without pressing or turning the START mechanism. Remove the tumbler from use and call for service.
17. Tumbler will not operate with lint panel open. **DO NOT** bypass lint panel safety switch to permit the tumbler to operate with the lint panel open.
18. Do not put articles soiled with vegetable or cooking oil in the tumbler, as these oils may not be removed during washing. Due to the remaining oil, the fabric may catch on fire by itself.
19. To reduce the risk of fire, **DO NOT** put clothes which have traces of any flammable substances such as machine oil, flammable chemicals, thinner, etc. or anything containing wax or chemicals such as in mops and cleaning cloths, or anything dry-cleaned at home with dry-cleaning solvent in the tumbler.
20. Use the tumbler only for its intended purpose, drying fabrics.
21. **ALWAYS** disconnect and lockout the electrical power to the tumbler before servicing. Disconnect power by shutting off appropriate breaker or fuse.
22. Install this tumbler according to the **INSTALLATION INSTRUCTIONS**. All connections for electrical power, grounding, and gas supply must comply with local codes and be made by licensed personnel when required.

Safety Information

23. Remove laundry immediately after tumbler stops.
24. Always read and follow manufacturer's instructions on packages of laundry and cleaning aids. Heed all warnings or precautions. To reduce the risk of poisoning or chemical burns, keep them out of reach of children at all times (preferably in a locked cabinet).
25. Do not tumble fiberglass curtains and draperies unless the label says it can be done. If they are dried, wipe out the cylinder with a damp cloth to remove particles of fiberglass.
26. Always follow the fabric care instructions supplied by the garment manufacturer.
27. Never operate the tumbler with any guards and/or panels removed.
28. **DO NOT** operate the tumbler if it is smoking, grinding, has missing or broken parts.
29. **DO NOT** bypass any safety devices.
30. Solvent vapors from dry-cleaning machines create acids when drawn through the heater of the drying unit. These acids are corrosive to the tumbler as well as to the laundry load being dried. Be sure make-up air is free of solvent vapors.
31. Failure to install, maintain, and/or operate this machine according to the manufacturer's instructions may result in conditions which can produce bodily injury and/or property damage.



WARNING

To reduce the risk of serious injury, install lockable door(s) to prevent public access to rear of tumblers.

W055

Specifications and Dimensions

Specifications	T30	T45
Noise level measured during operation at operator position of 3.3 feet (1 meter) in front of machine and 5.2 feet (1.6 meters) from floor.	66 dBA	67 dBA
Net Weight (approximate): Pounds (kg)	544 (247)	673 (305)
Cylinder Size: Inches (mm)	30 x 26 (762 x 660)	33 x 30 (838 x 762)
Cylinder Capacity (dry weight) Pounds (kg)	2 x 30 (2 x 13.6)	2 x 45 (2 x 20.5)
Drive Motor Horsepower**	1/4	1/2
Fan Motor Horsepower**	1/4	1/2
Maximum Airflow per Pocket**: C.F.M. (l/sec)	50 Hertz	340 (160)
	60 Hertz	400 (189)
Maximum Static Back Pressure*: Inches W.C. (mbar)	50 Hertz	0.8 (2.0)
	60 Hertz	0.9 (2.3)
Gas Models		
Gas Connection	1/2 in. NPT	1/2 in. NPT
Gas Burner Rating**: Btu/hr (kW, Mj/hr)	73,000 (21.4, 77)	95,000 (27.8, 100.2)
Electric Models		
Heating Element Rating**:	21 kW	N/A
Steam Models		
Steam Connection	3/4 in. NPT	N/A
Steam Coil Rating at 100 psig**: Boiler Horsepower (Btu/hr)	3.2 (111,000)	N/A
Steam Coil Rating at 15 psig**: Boiler Horsepower (Btu/hr)	2.2 (74,000)	N/A

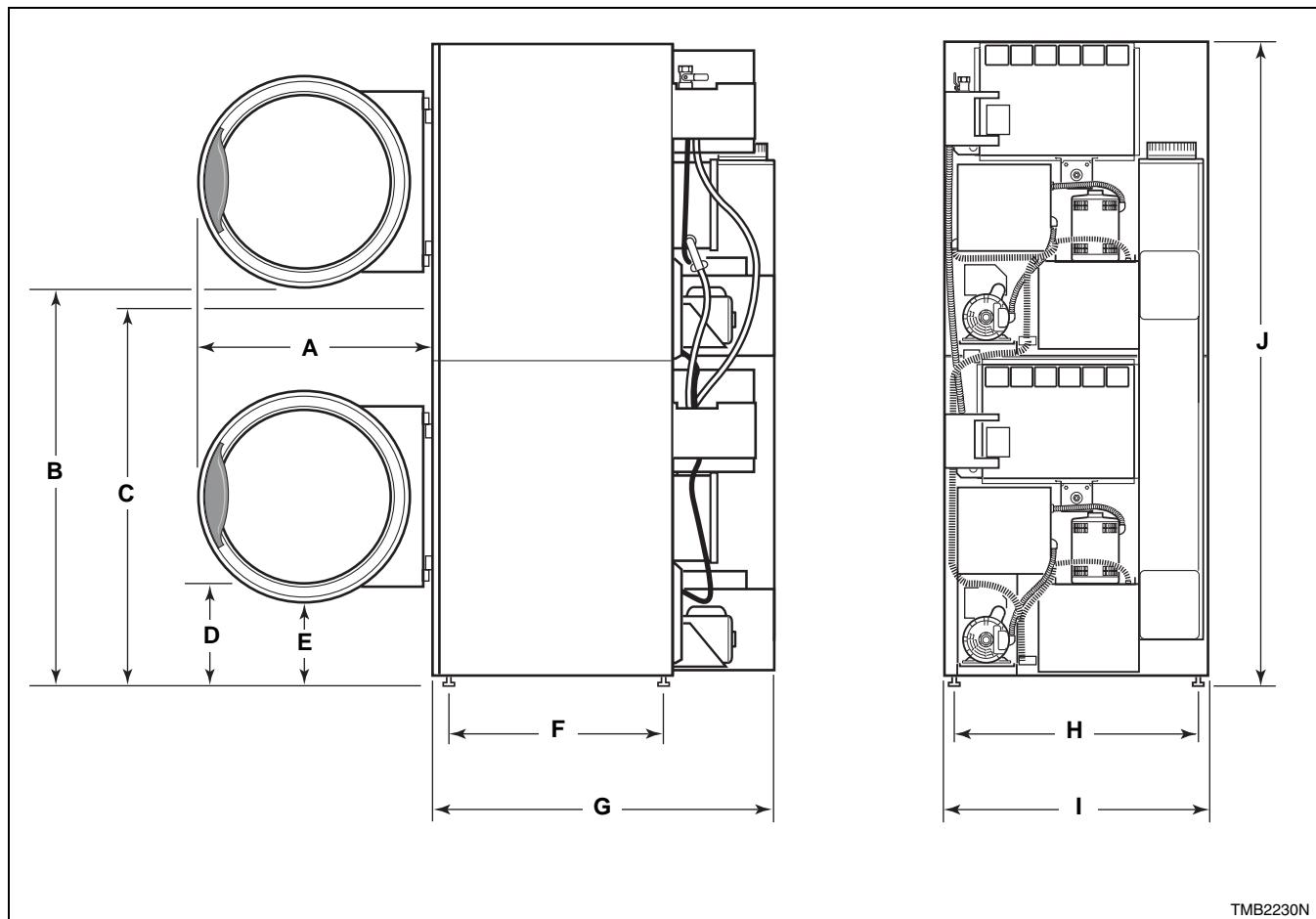
* with both pockets running

** for each pocket

N/A = Not Applicable

Specifications and Dimensions

Cabinet Dimensions

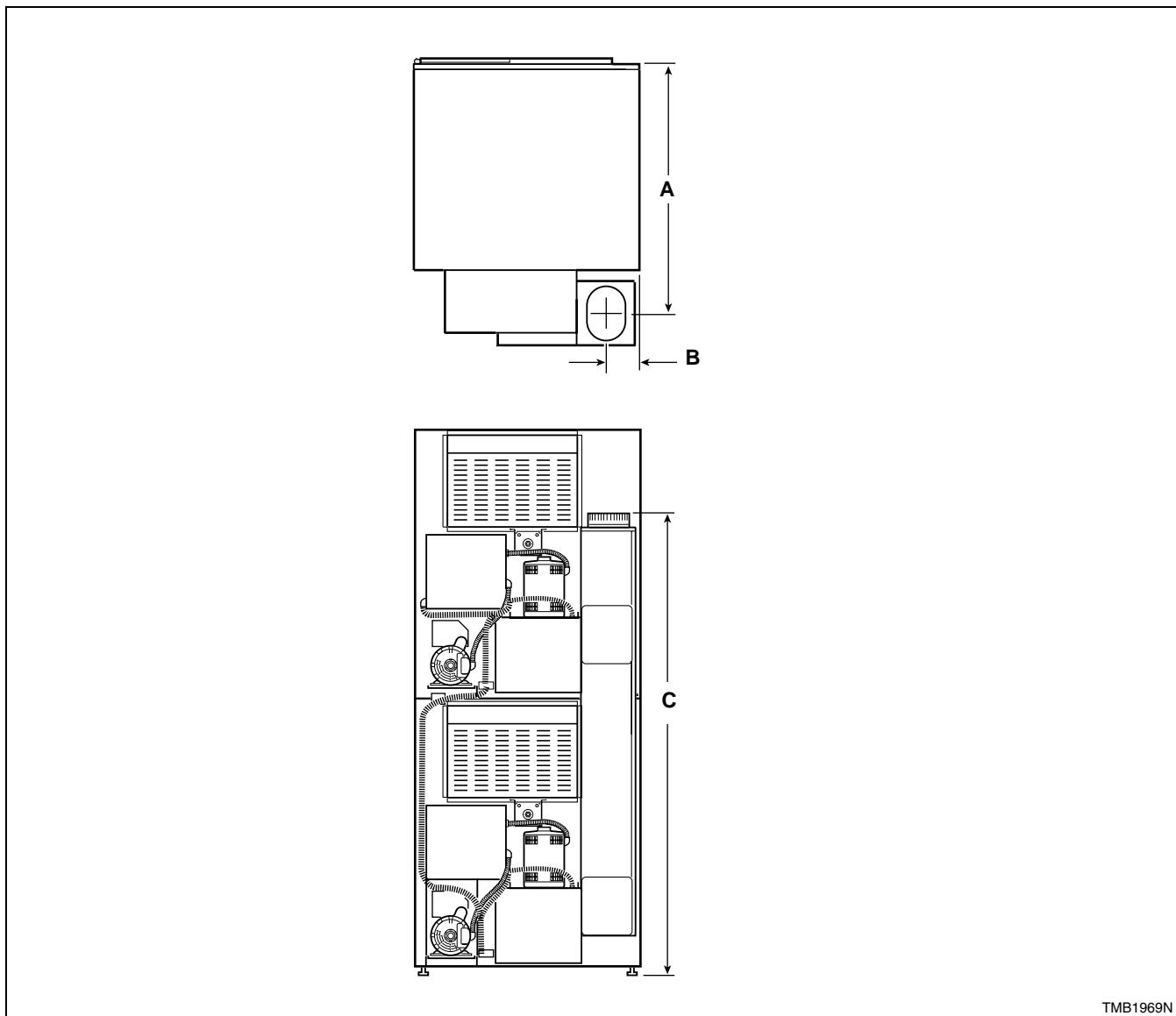


Models	A	B	C	D	E
T30	28 in. (711 mm)	48 in. (1219 mm)	44 in. (1118 mm)	11 in. (279 mm)	10 in. (254 mm)
T45	31.88 in. (810 mm)	49 in. (1245 mm)	N/A	N/A	9 in. (229 mm)
Models	F	G	H	I	J
T30	25.02 in. (636 mm)	42.76 in. (1086 mm)	27.38 in. (695 mm)	31.5 in. (800 mm)	76.25 in. (1937 mm)
T45	29.37 in. (746 mm)	48.62 in. (1235 mm)	30.50 in. (775 mm)	34.5 in. (876 mm)	81.25 in. (2063.75 mm)

N/A = Not Applicable

NOTE: To meet ADA compliance, install a 4 inch (102 mm) riser on T30 models only.

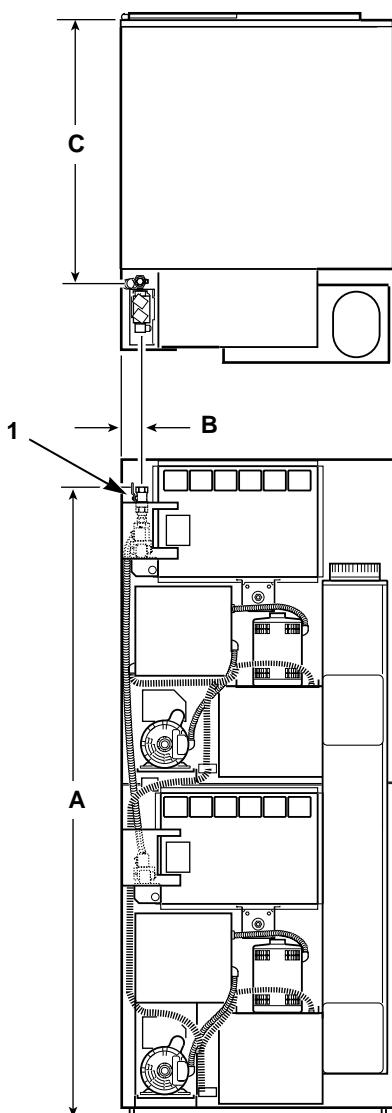
Exhaust Outlet Locations



Models	Rear Exhaust			
	Diameter	A	B	C
T30	Elliptical Fits 8 in. (203 mm)	36.54 in. (928 mm)	4.25 in. (108 mm)	62.42 in. (1585 mm)
T45	Elliptical Fits 10 in. (254 mm)	40.88 in. (1038 mm)	4.75 in. (121 mm)	66.00 in. (1676 mm)

Specifications and Dimensions

Gas Connection Locations

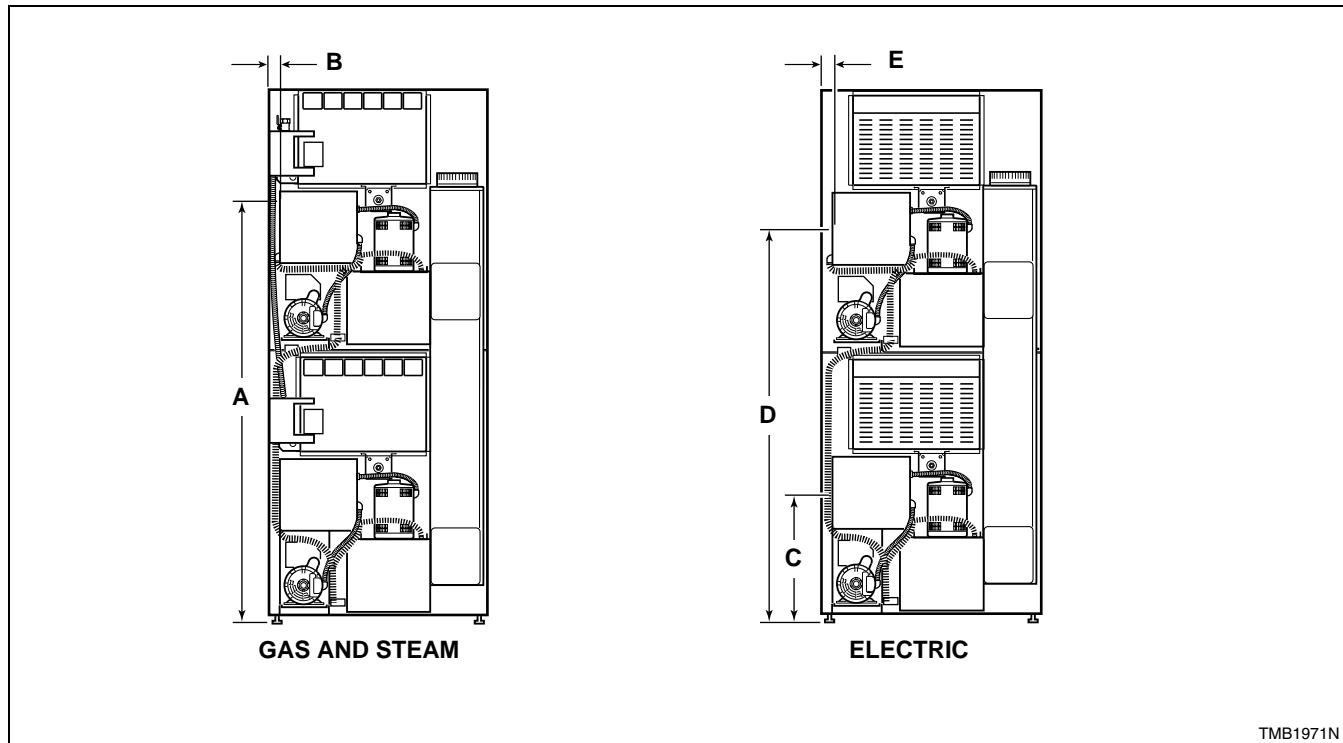


1 1/2 in. NPT

TMB1970N

Models		Gas Connection		
		A	B	C
T30	Non-CE and Non-Australian	75.20 in. (1910 mm)	1.74 in. (44 mm)	36.84 in. (936 mm)
	CE and Australian	75.28 in. (1912 mm)	2.5 in. (64 mm)	30.60 in. (777 mm)
T45		78.75 in. (2000 mm)	4.12 in. (105 mm)	42.88 in. (1089 mm)

Electrical Connection Locations



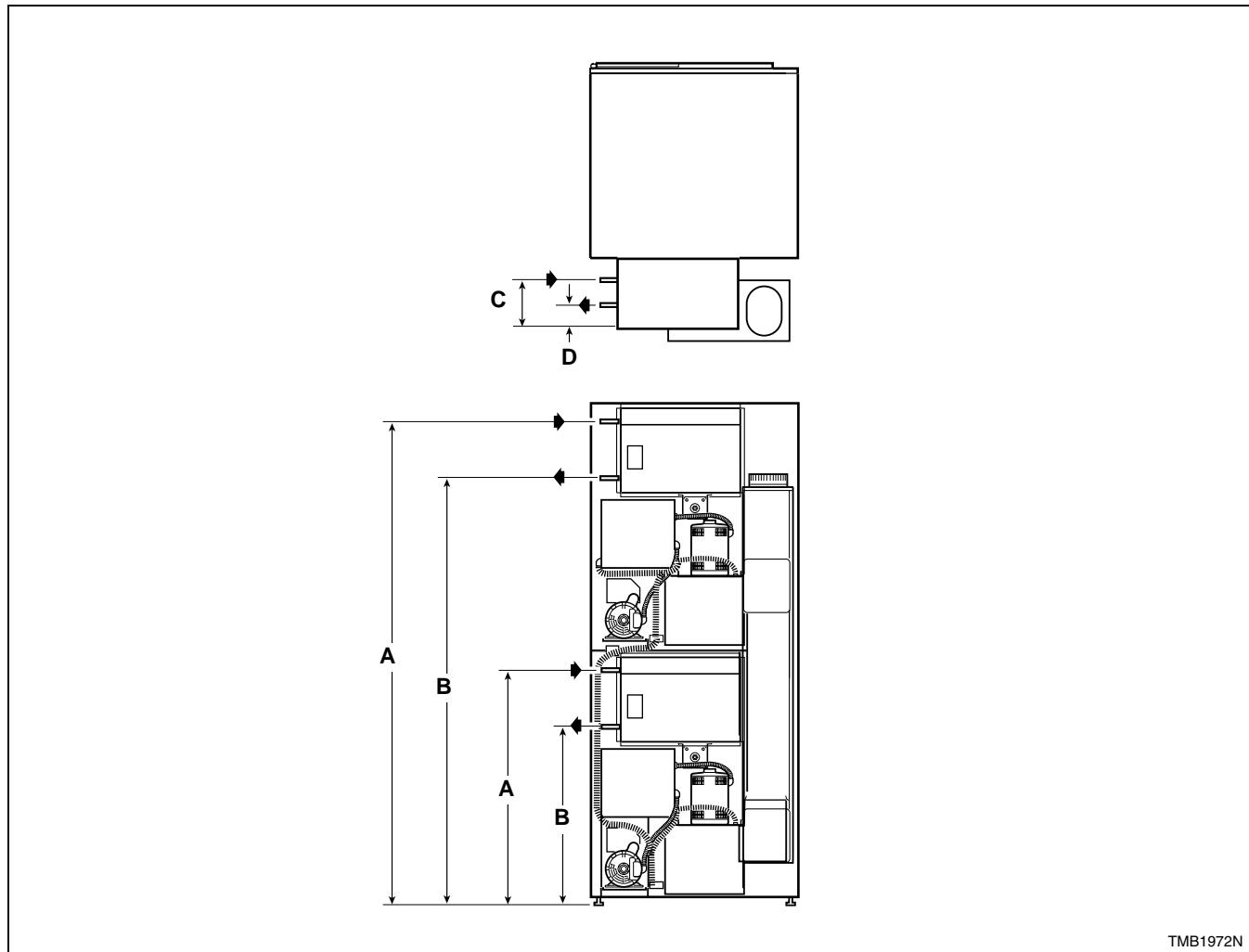
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Models	Electric Service				
	Gas and Steam Models		Electric Models		
	A	B	C	D	E
T30	59 in. (1498 mm)	1.75 in. (44 mm)	35.63 in. (905 mm)	73.21 in. (1859 mm)	2.28 in. (58 mm)
T45	62.5 in. (1588 mm)	1.75 in. (44 mm)	N/A	N/A	N/A

N/A = Not Applicable

Specifications and Dimensions

Steam Connection Locations



Models	Inlet		Outlet	
	A	C	B	D
T30 (Upper)	73.93 in. (1877 mm)	6.29 in. (160 mm)	62.71 in. (1592 mm)	2.39 in. (61 mm)
T30 (Lower)	36.35 in. (923 mm)	6.29 in. (160 mm)	25.13 in. (638 mm)	2.39 in. (61 mm)

NOTE: All connections use 3/4 inch NPT pipe.

Installation

Pre-Installation Inspection

Upon delivery, visually inspect the crate, carton and parts for any visible shipping damage. If the crate, carton, or cover is damaged or signs of possible damage are evident, have the carrier note the condition on the shipping papers before the shipping receipt is signed, or advise the carrier of the condition as soon as it is discovered.

Remove the crate and protective cover as soon as possible and check the items listed on the packing list. Advise the carrier of any damaged or missing articles as soon as possible. A written claim should be filed with the carrier immediately if articles are damaged or missing.

IMPORTANT: Warranty is void unless tumbler is installed according to instructions in this manual. Installation should comply with minimum specifications and requirements detailed herein, and with applicable local gas fitting regulations, municipal building codes, water supply regulations, electrical wiring regulations, and any other relevant statutory regulations. Due to varied requirements, applicable local codes should be thoroughly understood and all pre-installation work arranged for accordingly.

Material Required (Obtain Locally)	
All Models	One fused disconnect switch or circuit breaker.
Gas Models	One gas shut-off valve for gas service line to each tumbler.
Steam Models	One steam shut-off valve for steam service line to be connected upstream of solenoid steam valve. Steam shut-off valve for each condensate return line. Flexible steam hoses with a 125 psig (pounds per square inch gauge) (8.78 kg/sq. cm) working pressure for connecting steam coils. Refer to <i>Figure 15</i> for sizing and connection configurations. Steam trap for steam coil outlet to condensate return line. Optional – Vacuum breaker for condensate return line.

Table 1

Location Requirements

The tumbler must be installed on a level floor. Floor covering materials such as carpeting or tile should be removed.

To assure compliance, consult local building code requirements. The tumbler must not be installed or stored in an area where it will be exposed to water and/or weather.

IMPORTANT: DO NOT block the airflow at the rear of the tumbler with laundry or other articles. Doing so would prevent adequate air supply to the combustion chamber of the tumbler.

A typical tumbler enclosure is shown in *Figure 1*. Note that the enclosure touches the tumbler top and side panels. Also, note the minimum and maximum dimensions. Local codes and ordinances must be complied with.

	WARNING
To reduce the risk of serious injury, install lockable door(s) to prevent public access to rear of tumblers.	

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IMPORTANT: Install tumblers with sufficient clearance for servicing and operation. Refer to *Figure 1*.

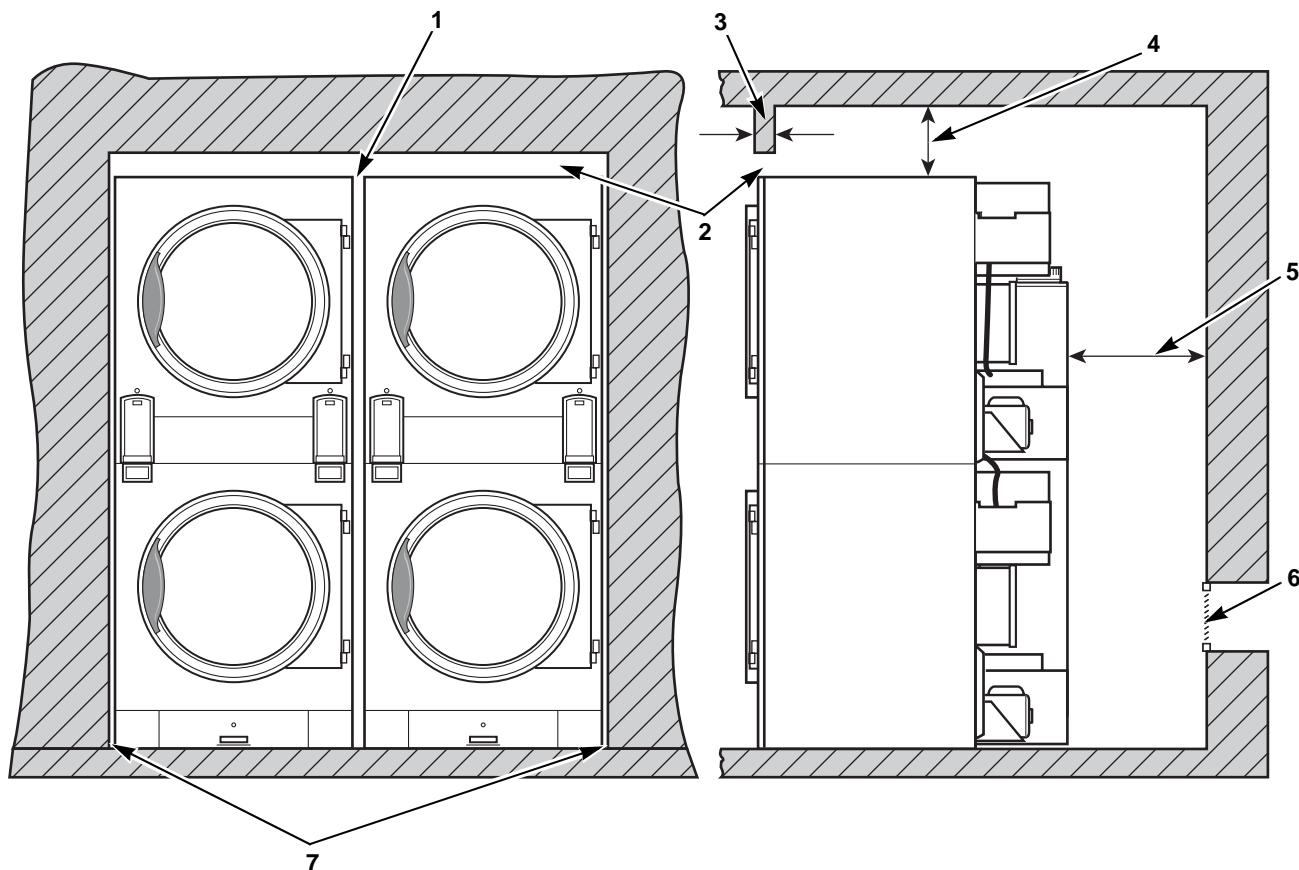
IMPORTANT: Keep tumbler area clear and free from combustible materials, gasoline and other flammable vapors and liquids.



WARNING

To reduce the risk of severe injury, clearance of tumbler cabinet from combustible construction must conform to the minimum clearances.

W056



TMB2110N

NOTE: Shaded areas indicate adjacent structure.

- 1 0.5 in. (13 mm) recommended between machines for removal or installation.
- 2 Allow 2 – 4 in. (51 – 102 mm) opening at top of machine to aid in removal or installation. A removable trim piece may be used to conceal the opening; zero clearance allowed for trim.
- 3 4 in. (102 mm) Maximum Header Thickness
- 4 12 in. (305 mm) Minimum Clearance
- 5 24 in. (610 mm) Minimum, 36 in. (914 mm) recommended for maintenance purposes.
- 6 Provision for Make-Up Air: Minimum 1.5 square feet T30 models, minimum 2 square feet T45 models. Location for reference only. May be anywhere behind tumbler.
- 7 0.25 in. (6 mm) recommended for removal or installation purposes, zero clearance allowed.

Figure 1

Position and Level the Tumbler

Unscrew the four shipping bolts (one at each corner). Remove tumbler from skid carefully to avoid putting pressure on the lower blower housing or motor assembly.

NOTE: Do not throw bolts away – they are the leveling legs.

Remove four nuts from the literature package, and screw one fully on to each leveling leg.

Screw the four leveling legs (bolts) back into the level adjusting fittings from the bottom.

Slide tumbler to its permanent location. Adjust the leveling legs until the unit is level within 0.125 inch (32 mm) higher in the front. Refer to *Figure 2*.

Tumbler must not rock. Lock leveling legs with nuts previously installed.

NOTE: The front of the tumbler should be slightly higher than the rear (approximately 0.125 inch, 3.18 mm). This will prevent the clothes, while tumbling, from wearing on the door glass gasket.

IMPORTANT: Keep tumbler as close to floor as possible. The unit must rest firmly on floor so weight of tumbler is evenly distributed.

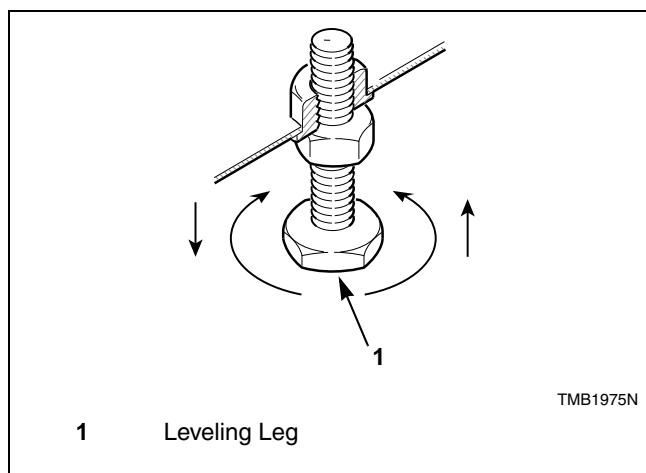


Figure 2

The stacked tumbler has a fifth leveling leg which is shipped in the up position. The fifth leveling leg MUST BE installed properly on the lower left side of the blower housing to stabilize the tumbler. Refer to *Figure 3*.

After leveling with the four cabinet leveling legs, lower the fifth leveling leg so it contacts the floor, and then secure the screws.

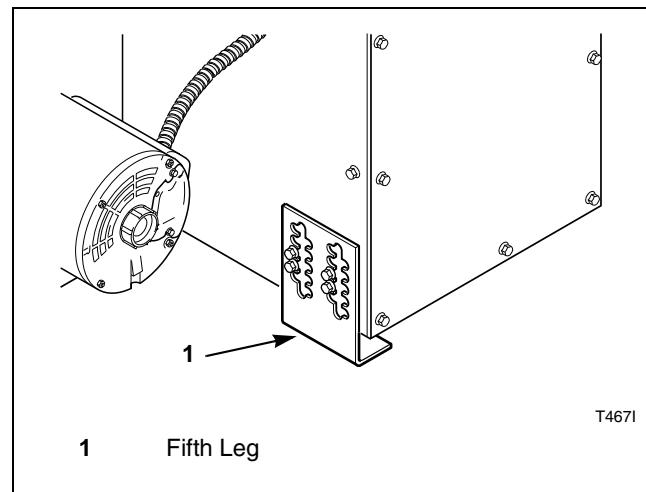
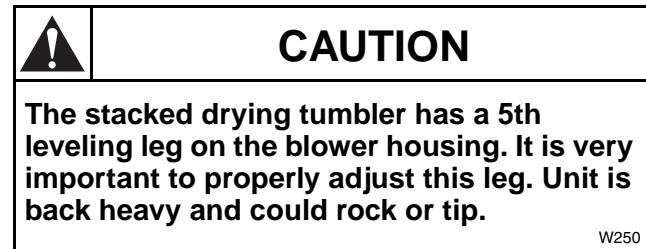


Figure 3

Before Placing Tumbler into Service

1. Remove or open all panels and check accessible bolts, nuts, screws, terminals and fittings for tightness.
2. Replace all panels and guards.
3. Remove and discard wire tie from the airflow switch so it can swing freely. Refer to *Figure 4*.

IMPORTANT: Airflow switch operation may be affected by:

- Clogged lint screen.
- Failure to remove wire tie from rear of machine. Refer to *Figure 4*.
- Lack of make-up air. Refer to *Exhaust Requirements* section.
- Obstruction in the exhaust duct. Refer to *Exhaust Requirements* section.

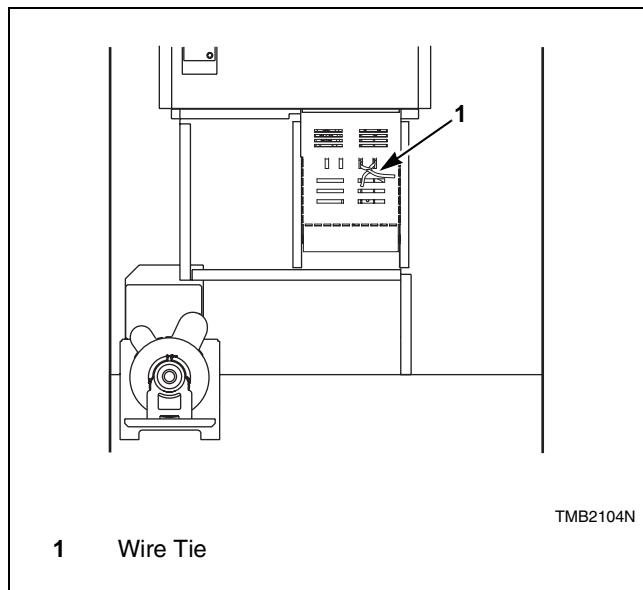


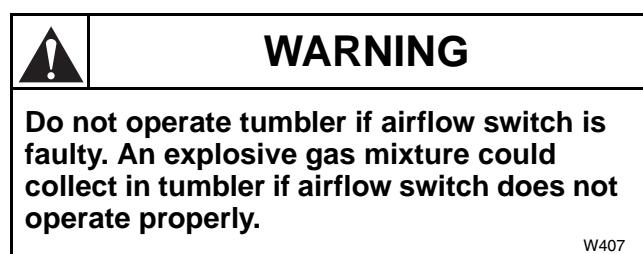
Figure 4

4. Turn on electrical supply to tumbler.
5. Open the supply valve for gas or steam heated tumblers.
6. After performing the previous checks, start the tumbler by pressing START. (Refer to the *Operating Manual* for detailed instructions.) Release the start button and open the loading door. The cylinder should stop rotating within seven seconds after the door is opened a maximum of 2 inches (51 mm). If it does not, adjust the loading door switch. Refer to *Adjustments* section.
7. **Gas tumblers:** Start the tumbler and check the burner flame. Adjust the air inlet shutter as required. Refer to *Adjustments* section.

IMPORTANT: The electronic ignition system will attempt to light the gas by sparking for the “trial for ignition” period. Refer to *Table 2*. If gas does not ignite within this period, the ignition control will go into a safety lockout and the valve will no longer open until the control is reset. It may be necessary to retry several times to bleed air from the gas lines. To reset, open and close the loading door and restart tumbler.

If lockout condition persists, check that the manual gas shut-off valve is in the ON position and that the gas service is properly connected. If condition still persists, remove tumbler from service.

8. Load the cylinder with a full load of clean rags and run to remove oil or dirt from cylinder.



Models	Location	Prepurge Time (seconds)	Trial for Ignition (seconds)	To Reset Lockout Condition:
T30	CE and Australia	18	10	Press lighted reset button in rear contactor box
	All others	1-3	10	Open loading door
T45		1-3	10	Open loading door

Table 2

9. Wipe out the cylinder using an all-purpose cleaner or detergent and water solution. Refer to *Figure 5*.

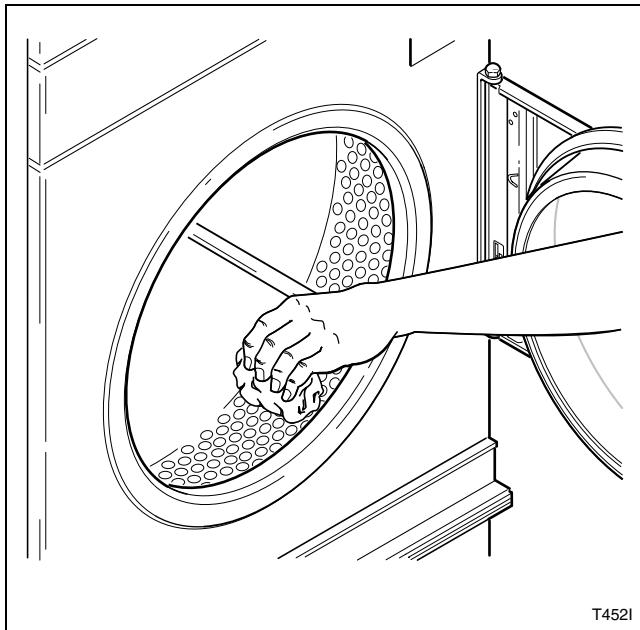


Figure 5

If the tumbler does not meet ANY of the listed requirements, remove tumbler from use. Refer to *Removing Tumbler from Service* section

Required for CE Models Only

Once machine is installed, please be sure to complete the following items:

- Review and verify machine operation with customer.
- Leave all literature and a signed Declaration of Conformity with customer.
- Review machine warranty information with customer.
- Apply warning sticker on front panel of machine, in language appropriate to country of sale (included in literature packet).

Installing CE Gas Drying Tumblers



WARNING

To reduce the risk of electric shock, fire, explosion, serious injury or death:

- Disconnect electric power to the tumbler before servicing.
- Close gas shut-off valve to gas tumbler before servicing.
- Close steam valve to steam tumbler before servicing.
- Never start the tumbler with any guards/panels removed.
- Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.

W002

General Information

This information is to be used when installing gas tumblers in countries, and/or on gases, different than the machine's factory configuration. Tumblers are supplied from the factory for operation on Natural Gas 1000 Btu/cu ft. (8914 kcal/m³), or L.P. Gas 2500 Btu/cu ft. (22,250 kcal/m³) in the countries of GB/IE/PT/ES/IT/GR/LU/CH. To install machines in any other country, or on any other gas, requires some level of modification.

Burner orifices, stickers, block-open kits, regulator springs and other parts needed for conversions are to be ordered separately.

Models are built in two different configurations:

- **Regulated Natural Gas** – Burner orifice is sized for Natural Gas, second family, group H (E) at 20 mbar inlet pressure. Regulator/governor is operational. Gas valve CAN be field-converted to a non-regulating type.
- **Unregulated L.P. (Liquefied Petroleum) Gas** – Burner orifice is sized for L.P., third family, group 3+ at 28.37 mbar inlet pressure. Regulator/governor is blocked open. Gas valve CANNOT be field-converted to a regulating type.

Serial plates supplied from the factory are configured for the countries of GB/IE/PT/ES/IT/GR/LU/CH. These instructions pertain to the situations when the country of use or gas supply is different than that on the serial plate.

Installation

Table 3 describes the different gases that are available in different CE countries, and how the machines need to be configured to operate with those gases. In the CE, there are Natural Gas configurations that do not allow for machine regulation, and L.P. Gas configurations that must be regulated. For L.P. Gas, third family B/P at 50 mbar, order regulated Natural Gas machines and convert according to Table 3.

Basic Configuration

1. Determine the necessary conversion operations to convert from the factory-supplied configuration to the desired configuration.
2. Perform the conversions required so the machine is properly configured for the desired country and gas (refer to **Specific Conversion Procedures** section):
 - How to Convert Gas Valve from Regulated to Unregulated

NOTE: Conversion from regulated to unregulated is only needed when regulated tumblers were ordered, but unregulated tumblers were needed, or if the gas supply type is changed at a later date.

- How to Change Burner Orifice Size
- How to Adjust Gas Valve Governor/Regulator
- How to Change Regulator Spring, DE/AT Only

3. If applicable, peel off the appropriate country sticker (included with machine) and apply it to the serial plate over the existing country information.
4. If applicable, peel off the appropriate conversion sticker (included with machine) and apply it to the data plate over the “ADJUSTED FOR _____ GAS: _____” information.
5. Commission tumbler for use.

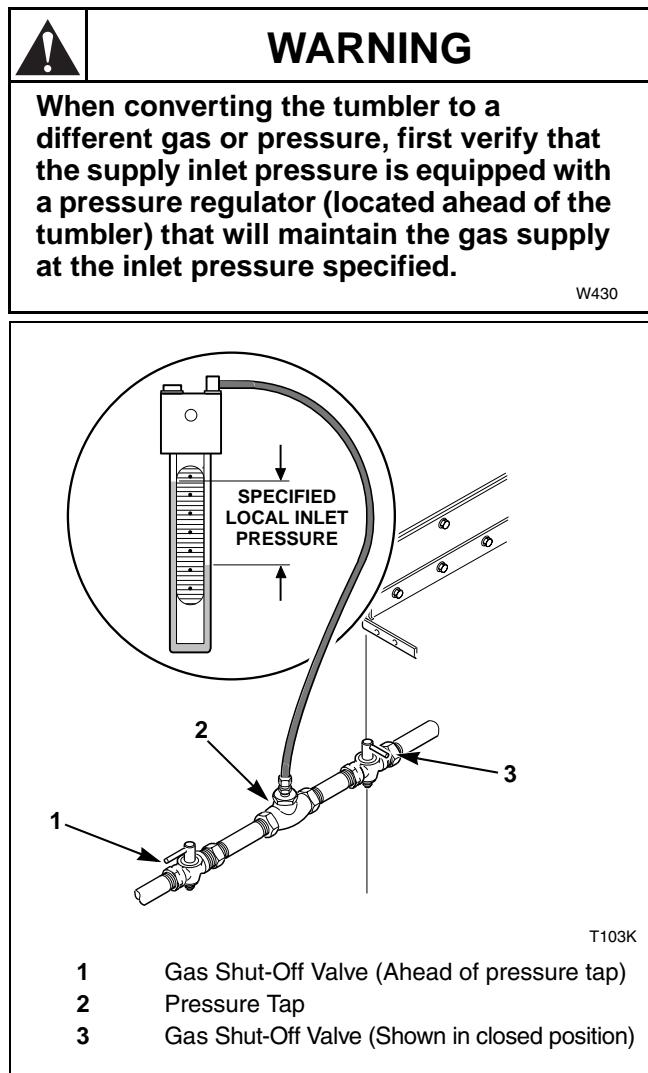


Figure 6

Gases and Configurations

Country Code	Gas Type	Group	Supply Pressure, mbar	Burner Orifice Pressure, mbar	Capacity/ Model	Diameter, mm	Quantity	Burner Orifice Part No.
DK/NO/ SE/FI/CZ/ EE/LV/LT/ SI/SK	Natural Gas	H	20	8.0	T30 T45	4.0 4.6	2	M402992 M411371
	L.P. Gas	B/P	30	No Governor	T30 T45	2.2 2.5	2	M401011 M401007
DE	Natural Gas	E	20	8.0	T30 T45	4.0 4.6	2	M402992 M411371
	L.P. Gas	LL	30	No Governor	T30 T45	2.2 2.5	2	M401011 M401007
NL	Natural Gas	L	25	11.0	T30 T45	4.0 4.6	2	M402992 M411371
	L.P. Gas	B/P	30	No Governor	T30 T45	2.2 2.5	2	M401011 M401007
BE/FR*	Natural Gas	E+	20 or 25	No Governor	T30 T45	3.3 3.7	2	M401021 M401000
	L.P. Gas	+	28 or 37	No Governor	T30 T45	2.2 2.5	2	M401011 M401007
GB/IE/PT/ ES/IT/GR/ LU/CH	Natural Gas	H	20	8.0	T30 T45	4.0 4.6	2	M402992 M411371
	L.P. Gas	+	28 or 37	No Governor	T30 T45	2.2 2.5	2	M401011 M401007
AT	Natural Gas	H	20	8.0	T30 T45	4.0 4.6	2	M402992 M411371
	L.P. Gas	B/P	30	No Governor	T30 T45	2.2 2.5	2	M401011 M401007
CY/IS/MT	L.P. Gas	B/P	30	No Governor	T30 T45	2.2 2.5	2	M401011 M401007
HU	Natural Gas	H	25	8.0	T30 T45	4.0 4.6	2	M402992 M411371
	L.P. Gas	B/P	30	No Governor	T30 T45	2.2 2.5	2	M401011 M401007
PL	Natural Gas	H	20	8.0	T30 T45	4.0 4.6	2	M402992 M411371
	L.P. Gas	3P	37	No Governor	T30 T45	2.2 2.5	2	M401011 M401007

Burner orifice information at 0-2000 feet (0-600 meters) altitude.

* For Natural Gas, Group E+ applications, convert using L.P. Gas model and replace burner orifice(s).

Table 3

Installation

Specific Conversion Procedures

How to Convert Gas Valve from Regulated to Unregulated

NOTE: Conversion from regulated to unregulated is only needed when regulated tumblers were ordered, but regulated tumblers were needed.

Johnson GM7000 gas valve:

1. Disconnect electrical power from tumbler. Close gas shut-off valve to tumbler. Refer to *Figure 7*.

2. Follow instructions in Conversion Kit, Part No. 431485 (Johnson Part No. GM-70 CBP).

NOTE: This kit does not contain any burner orifices.

3. Change burner orifice size as required by the appropriate table according to *How to Change Burner Orifice Size*.
4. Commission tumbler for use.

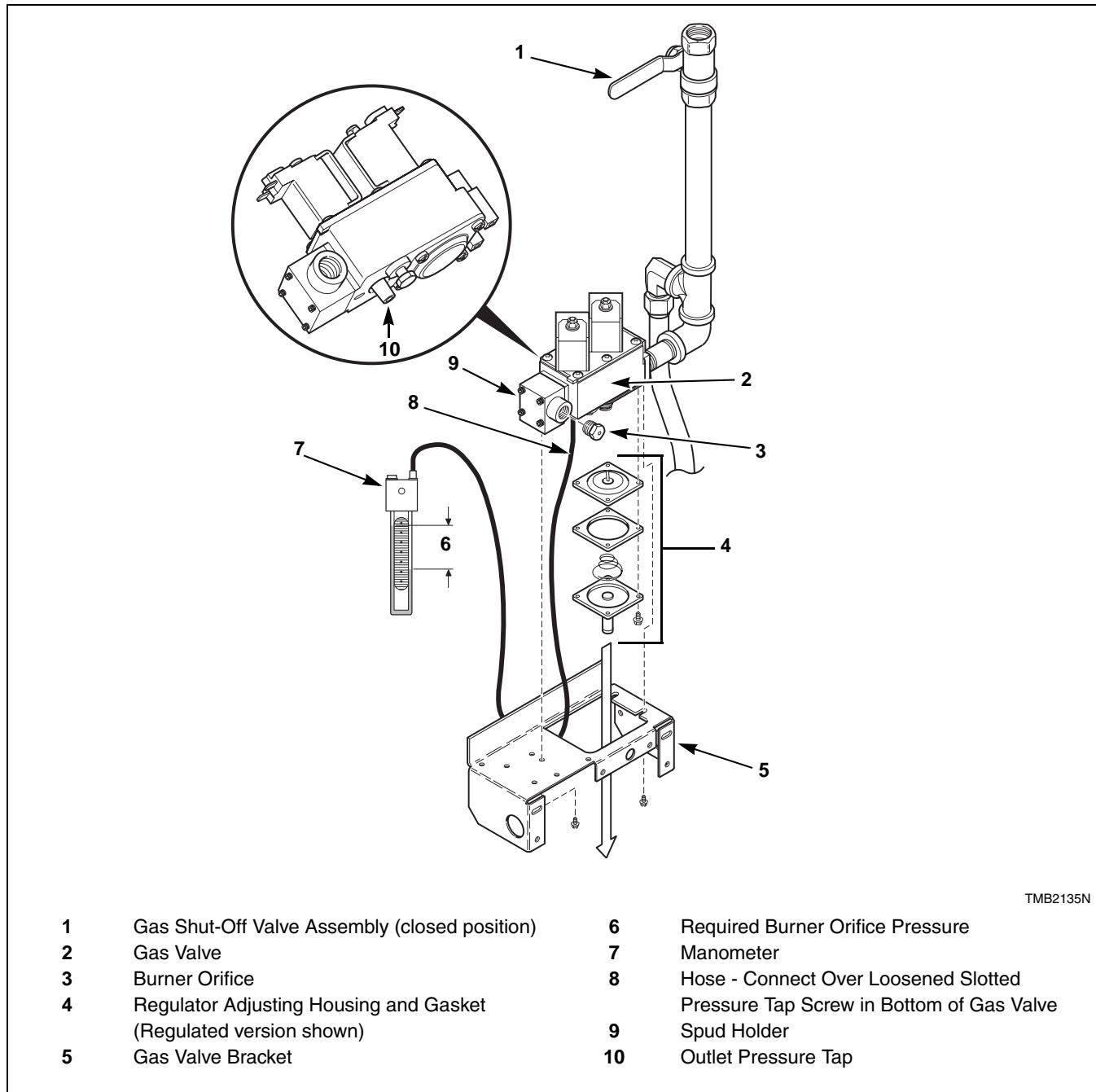


Figure 7

How to Change Burner Orifice Size

1. Disconnect electrical power from tumbler. Close gas shut-off valve to tumbler. Refer to *Figure 6*.
2. For Johnson GM7000 gas valve:
Remove burner orifice(s) from the spud holder. Refer to *Figure 7*.
3. Install the new, correct burner orifices. Refer to *Figure 8*. Torque each to 9 – 10 Nm.
4. Commission tumbler for use.

NOTE: Blank burner orifices are available as Part No. M400995.

How to Adjust Gas Valve Governor/Regulator

1. Check gas burner orifice (manifold) pressure as follows. Refer to *Figure 7*.
2. Loosen screw plug inside pressure tap located on underside of valve.
3. Connect a “U”- tube manometer (or similar pressure gauge) to the tap.
4. Start tumbler and note pressure once flame is burning. Remove regulator cap and adjust regulator screw until the burner orifice pressure per applicable table is achieved. Replace regulator cap and close needle valve (pressure tap).
5. Commission tumbler for use.

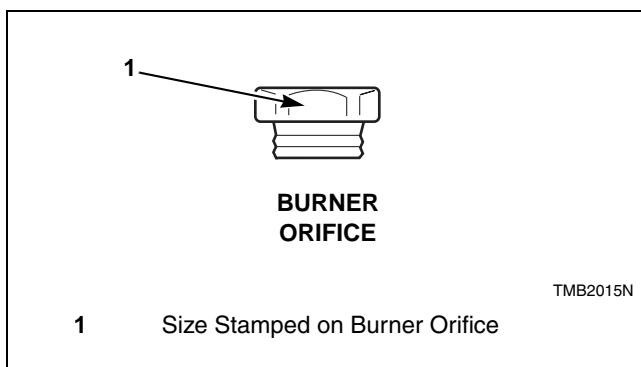


Figure 8

Exhaust Requirements

	WARNING
	<p>A drying tumbler produces combustible lint. To reduce the risk of fire, the tumbler must be exhausted to the outdoors.</p> <p>W057</p> <p>To reduce the risk of fire and accumulation of combustible gases, DO NOT exhaust tumbler air into a window well, gas vent, chimney or enclosed, unventilated area such as an attic wall, ceiling, crawl space under a building, or concealed space of a building.</p> <p>W059</p>

Layout

Whenever possible, install tumblers along an outside wall where duct length can be kept to a minimum, and make-up air can be easily accessed. Elbows and long vents tend to increase drying time. Construction must not block the airflow at the rear of the tumbler. Doing so would prevent adequate air supply to the tumbler's combustion chamber.

Make-Up Air

A tumbler is forced air exhausted and requires provisions for make-up air to replace air exhausted by the tumbler.

IMPORTANT: Do not obstruct the flow of combustion and ventilation air.

Make-up air openings should be as close to the tumbler(s) as possible.

The required make-up air opening to the outside for each tumbler (includes both pockets) is:

220 square inches (1418 sq. cm) for T30 models

288 square inches (1856 sq. cm) for T45 models

Make-up air openings with louvers will restrict airflow. The opening must be increased to compensate for area taken up by louvers.

Make-up air openings for a room containing tumbler(s) and/or gas fired hot water heater or other gravity vented appliances must be increased sufficiently to prevent downdrafts in any of the vents when all tumblers are in operation. Do not locate gravity vented appliances in the same room as tumblers. If it is necessary to duct make-up air to the tumbler(s), increase the area of the ductwork by 25% to compensate for any restriction in air movement.

Venting

	WARNING
	<p>To reduce the risk of fire due to increased static pressure, do not install in-line secondary lint filters or lint collectors.</p> <p>W730</p>

IMPORTANT: Installing in-line filters or lint collectors will cause increased static pressure, which will decrease tumbler efficiency and will void machine warranty.

For maximum efficiency and minimum lint accumulation, tumbler air must be exhausted to the outdoors by the shortest possible route.

Proper sized exhaust ducts are essential for proper operation. All elbows should be sweep type. Exhaust ducts must be assembled so the interior surfaces are smooth, so the joints do not permit the accumulation of lint. DO NOT use plastic or thin foil flexible ducts. Use exhaust ducts made of sheet metal or other non-combustible material. Use duct tape or pop-rivets on all seams and joints.

Verify that old ducts are thoroughly cleaned out before installing new tumbler(s).

	WARNING
	<p>Improperly sized or assembled ductwork causes excess back pressure which results in slow drying, lint collecting in the duct, lint blowing back into the room, and increased fire hazard.</p> <p>W355</p>

NOTE: Exhaust ducts must be constructed of sheet metal or other noncombustible material. Such ducts must be equivalent in strength and corrosion resistance to ducts made of galvanized sheet steel not less than 0.0195 inches (0.495 mm) thick. Local codes may require additional thickness.

Where the exhaust duct pierces a combustible wall or ceiling the opening must be sized per local codes. The space around the duct may be sealed with non-combustible material. Refer to *Figure 9*.

IMPORTANT: For best performance provide an individual exhaust duct for each tumbler. Do not install a hot water heater in a room containing tumblers. It is better to have the water heater in a separate room with a separate air inlet.

Individual Venting

For maximum efficiency and performance, it is preferred to exhaust tumbler(s) individually to the outdoors.

IMPORTANT: At no point may the cross sectional area of installed venting be less than the cross sectional area of the exhaust outlet of the tumbler.

The exhaust duct must be designed so the static back pressure measured 12 inches (305 mm) from the exhaust outlet does not exceed the maximum allowable pressure specified on the installation sticker on the rear of the tumbler.

NOTE: Static back pressure must be measured with both pockets running.

The maximum allowable length venting of the same diameter as the exhaust thimble is 14 feet (4.3 m) and two 90° elbows or equivalent. If the equivalent length of a duct required for an installation exceeds the maximum allowable equivalent length, the diameter of a round duct must be increased by 10% for each additional 20 feet (6.1 m). Cross section area of a rectangular duct must be increased by 20% for each additional 20 feet (6.1 m). Refer to *Table 4* to determine equivalent venting.

Duct Diameter	Equivalent Length of Straight Duct
10 in. (254 mm)	One 90° elbow = 11.6 ft. (3.5 m)
12 in. (305 mm)	One 90° elbow = 14 ft. (4.3 m)
14 in. (355.6 mm)	One 90° elbow = 16 ft. (4.9 m)
16 in. (406.4 mm)	One 90° elbow = 18.7 ft. (5.7 m)
18 in. (457.2 mm)	One 90° elbow = 21 ft. (6.4 m)

Equivalent Length (feet) = 1.17 x Duct Diameter (inches)

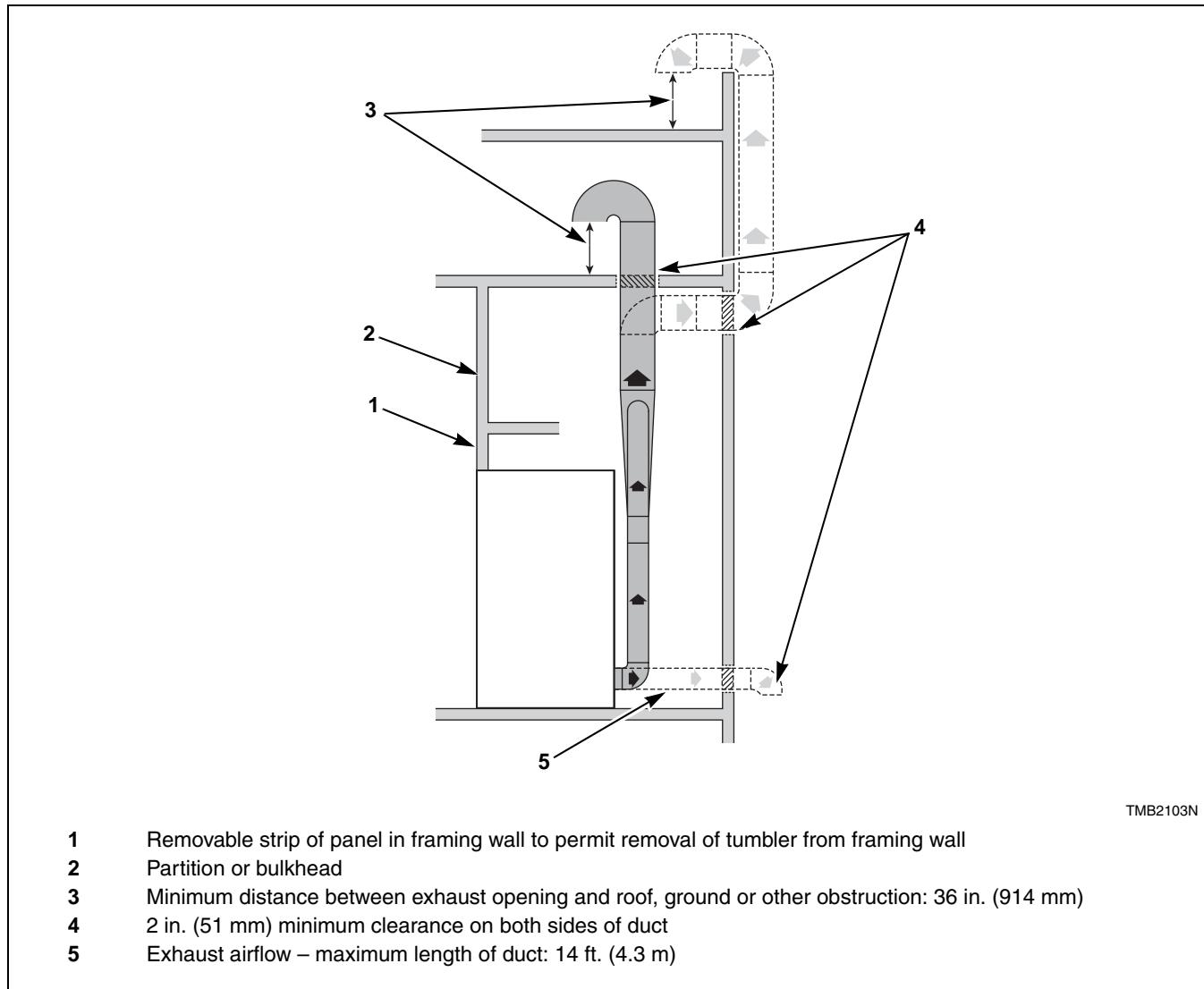
Table 4

Example: A 12 inch (305 mm) diameter duct's equivalent length of 14 feet (4.3 m) of duct and two 90° elbows is:

$$\begin{aligned}
 \text{Equivalent Length} &= 14 \text{ feet} + (2) 90^\circ \text{ elbows} \\
 &= 14 \text{ feet} + 14 \text{ feet} + 14 \text{ feet} \\
 &= 42 \text{ feet (12.8 m)}
 \end{aligned}$$

With the tumbler in operation, and both pockets running, airflow at any point in the duct should be at least 1200 feet per minute (366 meters per meter) to ensure that lint remains airborne. If 1200 feet per minute cannot be maintained, schedule monthly inspections and cleaning of the ductwork.

Exhaust Requirements



TMB2103N

- 1 Removable strip of panel in framing wall to permit removal of tumbler from framing wall
- 2 Partition or bulkhead
- 3 Minimum distance between exhaust opening and roof, ground or other obstruction: 36 in. (914 mm)
- 4 2 in. (51 mm) minimum clearance on both sides of duct
- 5 Exhaust airflow – maximum length of duct: 14 ft. (4.3 m)

Figure 9

NOTE: Do not install wire mesh or screen in exhaust duct opening to avoid lint build-up or impacting proper discharge of air from tumblers.

NOTE: Where exhaust duct pierces a combustible wall or ceiling, the opening must be sized per local codes.

NOTE: Inside of duct must be smooth. Do not use sheet metal screws to join sections.

Consult your local building code for regulations which may also apply.

Manifold Venting

While it is preferable to exhaust tumblers individually to the outdoors, a main collector duct may be used if it is sized according to *Figure 11* or *Figure 12*. This illustration indicates minimum diameters, and should be increased if the collector length exceeds 14 feet (4.3 m) and two 90° elbows. The diameter of a round duct must be increased by 10% for each additional 20 feet (6.1 m). Cross sectional area of a rectangular or square duct must be increased 20% for each additional 20 feet (6.1 m). Refer to *Table 5* or *Table 6* to determine equivalent ducting sizing. The collector duct may be rectangular or square in cross section, as long as the area is not reduced. Provisions **MUST** be made for lint removal and cleaning of the collector duct.

The vent collector system must be designed so the static back pressure measured 12 inches (305 mm) from the exhaust outlet does not exceed the maximum allowable pressure specified on the installation sticker on the rear of tumbler. Static back pressure must be measured with all tumblers vented into the collector operating.

NOTE: Never connect a tumbler duct at a 90° angle to the collector duct. Refer to *Figure 10*. Doing so will cause excessive back pressure, resulting in poor performance. Never connect two tumbler exhaust ducts directly across from each other at the point of entry to the collector duct.

With the tumbler in operation, and both pockets running, airflow at any point in the duct should be at least 1200 feet per minute (366 meters per meter) to ensure that lint remains airborne. If 1200 feet per minute cannot be maintained, schedule monthly inspections and cleaning of the ductwork.

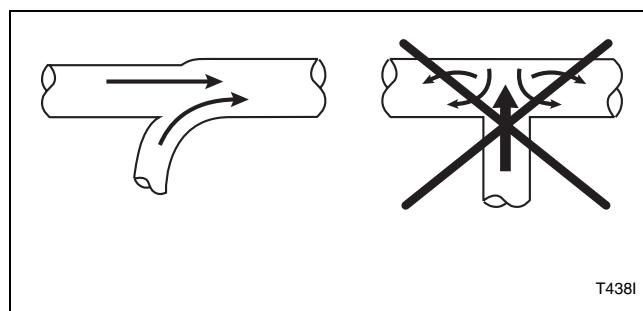


Figure 10

Exhaust Requirements

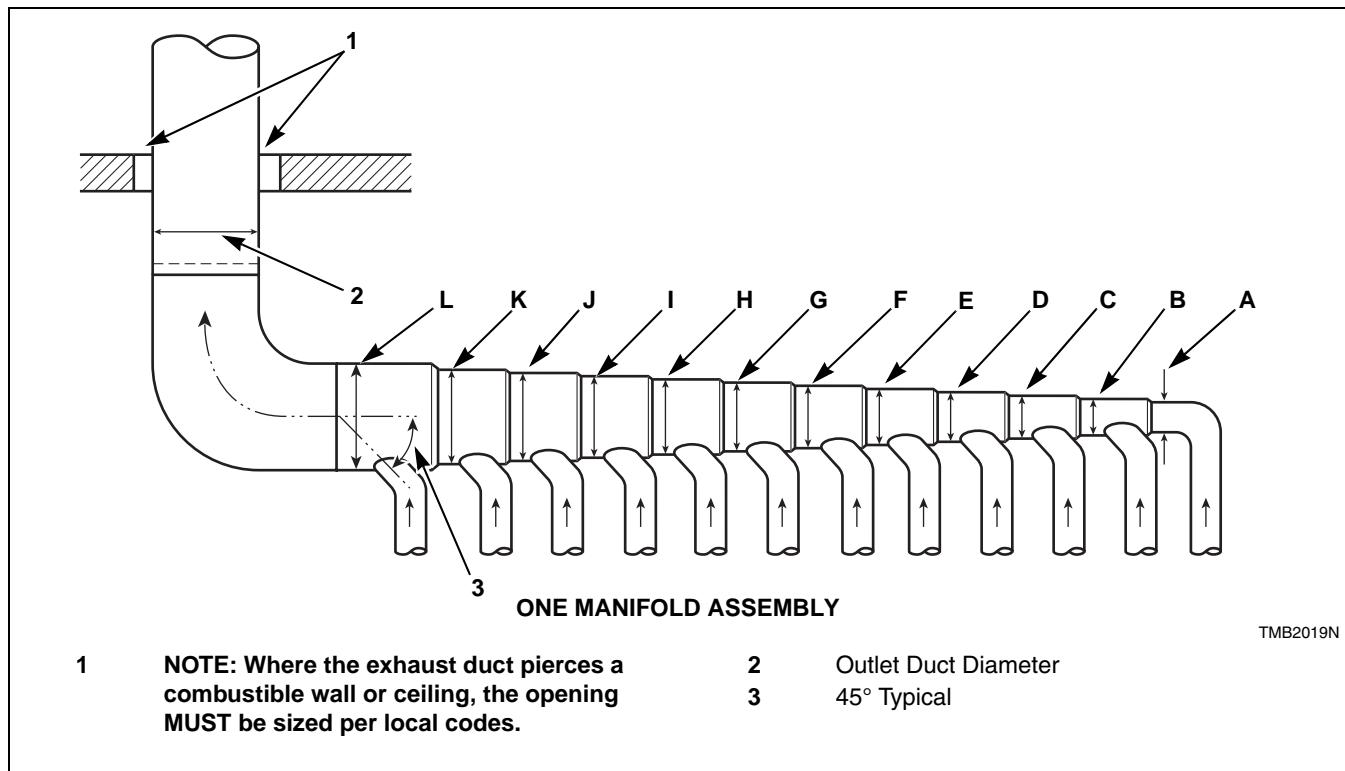


Figure 11

Duct Station	T30		T45	
	8 in. (203 mm) Duct		10 in. (254 mm) Duct	
A	8 in. (203 mm)		10 in. (254 mm)	
B	12 in. (305 mm)		15 in. (381 mm)	
C	15 in. (381 mm)		18 in. (457 mm)	
D	17 in. (432 mm)		21 in. (533 mm)	
E	19 in. (483 mm)		24 in. (610 mm)	
F	21 in. (533 mm)		26 in. (660 mm)	
G	23 in. (584 mm)		28 in. (711 mm)	
H	24 in. (610 mm)		30 in. (762 mm)	
I	26 in. (660 mm)		32 in. (813 mm)	
J	27 in. (686 mm)		33 in. (838 mm)	
K	28 in. (711 mm)		35 in. (889 mm)	
L	30 in. (762 mm)		36 in. (914 mm)	

Table 5

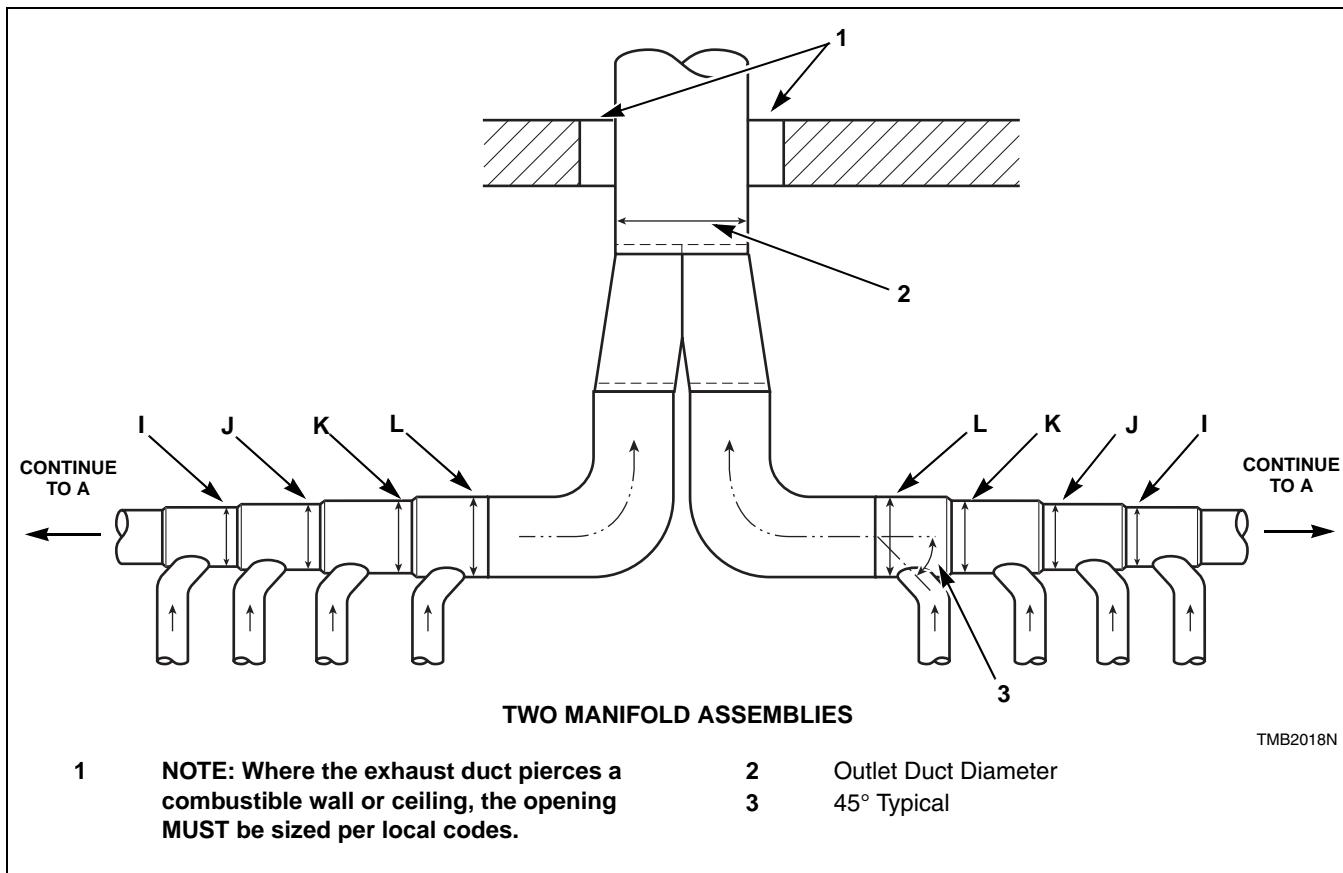


Figure 12

Duct Station	T30		T45	
	8 in. (203 mm) Duct		10 in. (254 mm) Duct	
A	12 in. (305 mm)		15 in. (381 mm)	
B	17 in. (432 mm)		22 in. (559 mm)	
C	22 in. (559 mm)		26 in. (660 mm)	
D	25 in. (635 mm)		30 in. (762 mm)	
E	27 in. (686 mm)		34 in. (864 mm)	
F	30 in. (762 mm)		37 in. (940 mm)	
G	33 in. (838 mm)		40 in. (1016 mm)	
H	34 in. (864 mm)		43 in. (1092 mm)	
I	37 in. (940 mm)		46 in. (1168 mm)	
J	39 in. (991 mm)		47 in. (1194 mm)	
K	40 in. (1016 mm)		50 in. (1270 mm)	
L	43 in. (1092 mm)		51 in. (1295 mm)	

Table 6

Gas Requirements

	WARNING
	<p>To reduce the risk of fire or explosion, DO NOT CONNECT THE GAS LINE TO THE TUMBLER IF THE GAS SERVICE IS NOT THE SAME AS THAT SPECIFIED ON THE TUMBLER SERIAL PLATE! It will first be necessary to convert the gas burner orifice and gas valve. Appropriate conversion kits are available.</p> <p>W060</p>

IMPORTANT: Any product revisions or conversions must be made by the Manufacturer's Authorized Dealers, Distributors or local service personnel.

IMPORTANT: The tumbler must be isolated from the gas supply piping system by closing its individual manual shut-off valve during any pressure testing of the gas supply piping system at test pressure equal to or less than 0.5 psig (3.45 kPa, 34.5 mbar).

IMPORTANT: The tumbler and its manually operated appliance gas valve must be disconnected from the gas supply piping system during any pressure testing of that system at test pressures in excess of 0.5 psi (3.45 kPa, 34.5 mbar).

IMPORTANT: The installation must comply with local codes or, in the absence of local codes:

- with the latest edition of the "National Fuel Gas Code," ANSI Z223.1/NFPA 54 in the U.S.A.,
- with CAN/CSA-B149.1 or Natural Gas and Propane Installation Code in Canada,
- and Australian Gas Association/Australian L.P. Gas Association requirements in Australia.

Obtain specific gas service pipe size from the gas supplier. Refer to *Table 7* for general pipe size.

The following must be furnished and installed by the customer for the gas service line to each tumbler. Refer to *Figure 13*.

- Sediment traps
- Shut-off valves
- Supply pressure taps

It is important that equal pressure be maintained at all tumbler gas connections. This can best be done by installing a one inch (25 mm) pipe gas loop. Refer to *Figure 14*.

	WARNING
	<p>To reduce the risk of fire or explosion, if the tumbler is to be connected to Liquefied Petroleum (L.P.) gas, a vent to the outdoors must be provided in the room where the tumbler is installed.</p> <p>W062</p>

NATURAL GAS line pressure must be maintained at 6.5 water column inches (1.62 kPa) with no less than 5 water column inches (1.24 kPa) and no more than 10.5 water column inches (2.61 kPa), with all gas appliances running (tumblers, water heaters, space heaters, furnace, etc.). An in-line pressure regulator may be required if the line pressure exceeds 8 water column inches (2.0 kPa) with all gas appliances running.

LIQUID PETROLEUM GAS (L.P.) line pressure must be maintained at 11 water column inches (2.74 kPa), with no less than 10 water column inches (2.49 kPa) and no more than 13 water column inches (3.23 kPa), with all gas appliances running (tumblers, water heaters, space heaters, furnace, etc.).

For converting Non-CE models from Natural Gas to L. P. Gas:

T30 – M4707P3

T45 – M4880P3

CE GASES refers to *Installing CE Gas Drying Tumblers* sections, the above data does not apply to the CE.

Turn on gas and check all pipe connections (internal and external) for gas leaks with a non-corrosive leak detection fluid. Purge air in gas service line by operating the tumblers in the drying mode. If burner does not light and unit goes into lockout, open and close the door and restart. Repeat these steps until burner ignites. **Use pipe compound, resistant to actions of L.P. gas, on all pipe threads.**



WARNING

Check all pipe connections, internal and external, for gas leaks using a non-corrosive leak detection fluid. To reduce the risk of explosion or fire, DO NOT USE AN OPEN FLAME TO CHECK FOR GAS LEAKS! Gas connections should be checked twice a year for leakage.

W635

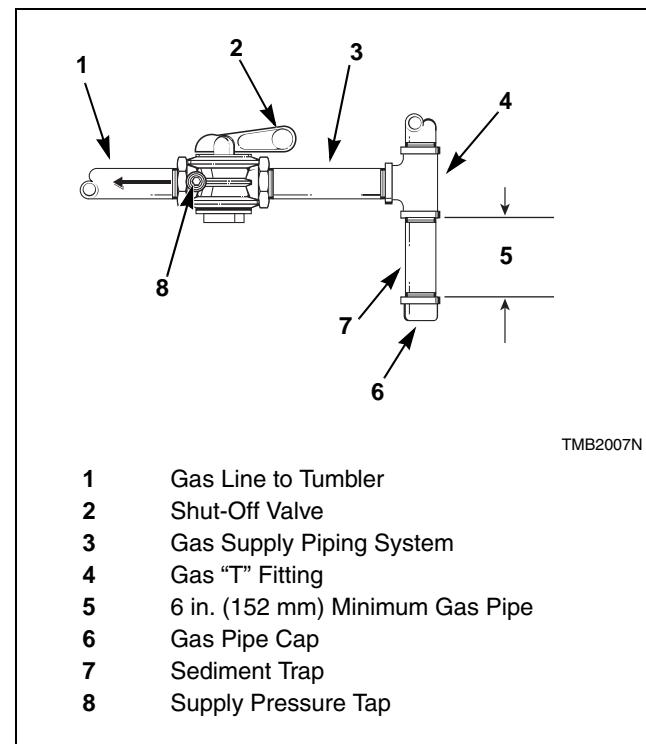


Figure 13

Gas Requirements

Gas Supply Pipe Sizing and Looping

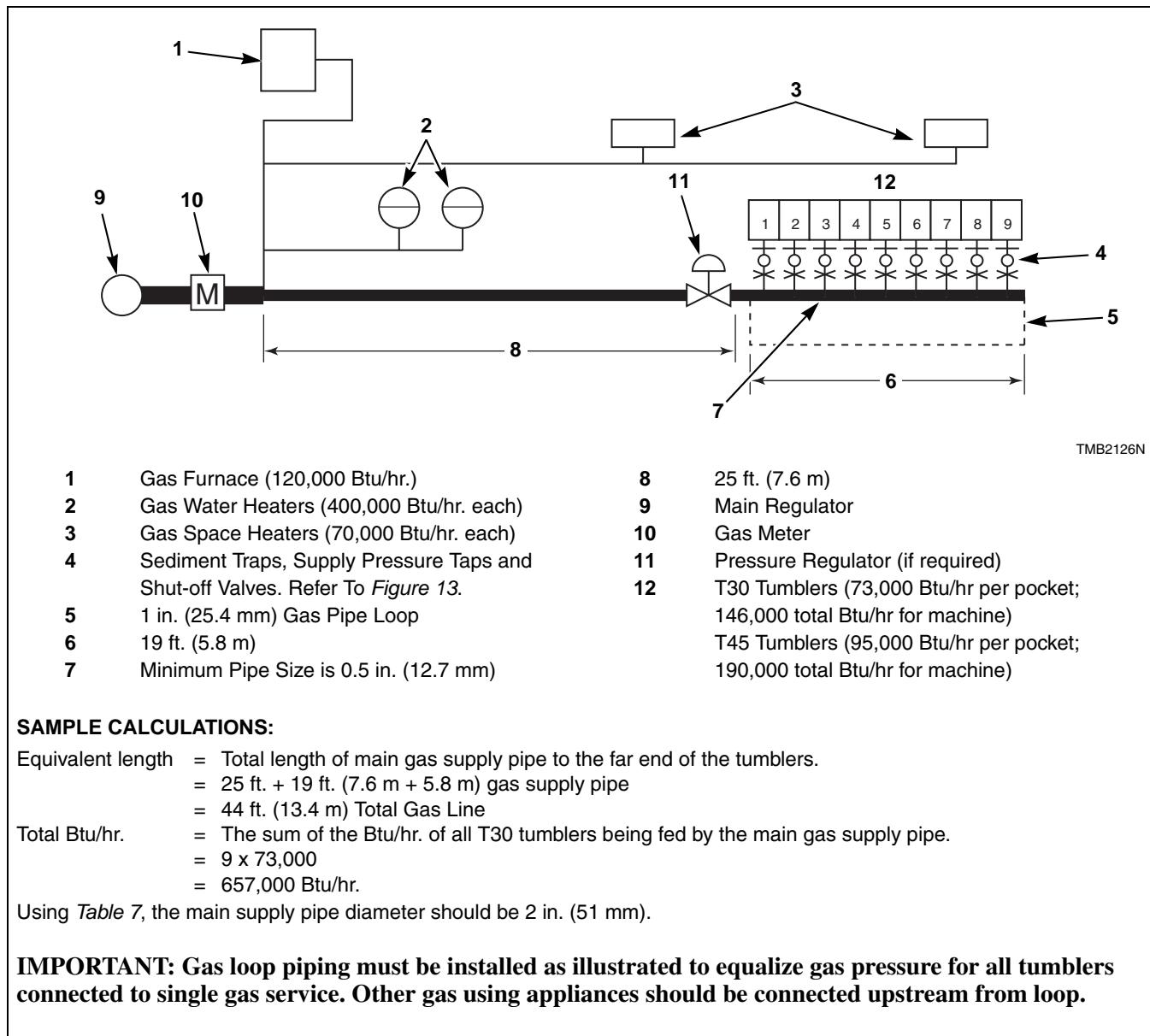


Figure 14

Gas Pipe Size Required for 1000 Btu Natural Gas — 0.64 Specific Gravity at 7 ± 1.5 inches (17.4 ± 4 mbar, 1.74 ± 0.37 kPa) Water Column Pressure						
Gas Appliances Total Btu/hr	Equivalent Length					
	25 feet (7.63 m)	50 feet (15.25 m)	75 feet (22.88 m)	100 feet (30.50 m)	125 feet (38.13 m)	150 feet (45.75 m)
	Based on 0.3 in. Water Column Pressure Drop for Length Given Sizes shown in inches (mm)					
100,000	0.75 (19.05)	0.75 (19.05)	1 (25.40)	1 (25.40)	1 (25.40)	1 (25.40)
120,000	0.75 (19.05)	1 (25.40)	1 (25.40)	1 (25.40)	1 (25.40)	1 (25.40)
140,000	0.75 (19.05)	1 (25.40)	1 (25.40)	1 (25.40)	1 (25.40)	1.25 (31.75)
160,000	0.75 (19.05)	1 (25.40)	1 (25.40)	1.25 (31.75)	1.25 (31.75)	1.25 (31.75)
180,000	1 (25.40)	1 (25.40)	1 (25.40)	1.25 (31.75)	1.25 (31.75)	1.25 (31.75)
200,000	1 (25.40)	1 (25.40)	1.25 (31.75)	1.25 (31.75)	1.25 (31.75)	1.5 (38.10)
300,000	1 (25.40)	1.25 (31.75)	1.25 (31.75)	1.5 (38.10)	1.5 (38.10)	1.5 (38.10)
400,000	1.25 (31.75)	1.25 (31.75)	1.5 (38.10)	1.5 (38.10)	1.5 (38.10)	2 (50.80)
500,000	1.25 (31.75)	1.5 (38.10)	1.5 (38.10)	2 (50.80)	2 (50.80)	2 (50.80)
600,000	1.5 (38.10)	1.5 (38.10)	2 (50.80)	2 (50.80)	2 (50.80)	2 (50.80)
700,000	1.5 (38.10)	2 (50.80)	2 (50.80)	2 (50.80)	2 (50.80)	2.5 (63.50)
800,000	1.5 (38.10)	2 (50.80)	2 (50.80)	2 (50.80)	2.5 (63.50)	2.5 (63.50)
900,000	2 (50.80)	2 (50.80)	2 (50.80)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)
1,000,000	2 (50.80)	2 (50.80)	2 (50.80)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)
1,100,000	2 (50.80)	2 (50.80)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)
1,200,000	2 (50.80)	2 (50.80)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)
1,300,000	2 (50.80)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)	3 (76.20)
1,400,000	2 (50.80)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)	3 (76.20)	3 (76.20)
1,500,000	2 (50.80)	2.5 (63.50)	2.5 (63.50)	2.5 (63.50)	3 (76.20)	3 (76.20)
1,600,000	2 (50.80)	2.5 (63.50)	2.5 (63.50)	3 (76.20)	3 (76.20)	3 (76.20)
1,700,000	2 (50.80)	2.5 (63.50)	2.5 (63.50)	3 (76.20)	3 (76.20)	3 (76.20)
1,800,000	2.5 (63.50)	2.5 (63.50)	3 (76.20)	3 (76.20)	3 (76.20)	3 (76.20)
1,900,000	2.5 (63.50)	2.5 (63.50)	3 (76.20)	3 (76.20)	3 (76.20)	3 (76.20)
2,000,000	2.5 (63.50)	2.5 (63.50)	3 (76.20)	3 (76.20)	3 (76.20)	3.5 (88.90)
2,200,000	2.5 (63.50)	3 (76.20)	3 (76.20)	3 (76.20)	3.5 (88.90)	3.5 (88.90)
2,400,000	2.5 (63.50)	3 (76.20)	3 (76.20)	3 (76.20)	3.5 (88.90)	3.5 (88.90)
2,600,000	2.5 (63.50)	3 (76.20)	3 (76.20)	3.5 (88.90)	3.5 (88.90)	3.5 (88.90)
2,800,000	2.5 (63.50)	3 (76.20)	3 (76.20)	3.5 (88.90)	3.5 (88.90)	3.5 (88.90)
3,000,000	2.5 (63.50)	3 (76.20)	3.5 (88.90)	3.5 (88.90)	3.5 (88.90)	4 (101.60)

For L.P. Gas, correct the total Btu/hr by multiplying it by 0.6. The answer is the equivalent Btu on the above chart.

The installation must conform with local codes or, in the absence of local codes:

- with the latest edition of the “National Fuel Gas Code,” ANSI Z223.1/NFPA 54 in the U.S.A.,
- with CAN/CSA-B149.1 or Natural Gas and Propane Installation Code in Canada,
- and Australian Gas Association/Australian L.P. Gas Association requirements in Australia.

Table 7

Gas Requirements

High Altitude Burner Orifice Sizing

For proper operation at altitudes above 2000 feet (610 meters), the gas burner orifice size must be reduced to ensure complete combustion. Refer to *Table 8*.

For CE models, consult local gas supplier.

Model	Gas	Altitude		Burner Orifice					New Rate
		Feet	Meters	No.	Inches	mm	Quantity	Part Number	(Btu/hr.)*
T30	Natural Gas	2001-4000	610-1220	22	0.1570	4.0	2	M402996	134,320
		4001-6000	1221-1830	24	0.1520	3.9		M402980	122,640
		6001-8000	1831-2440	26	0.1470	3.7		M401000	110,960
		8001-10,000	2441-3050	28	0.1405	3.6		M401014	99,280
	L.P. Gas	2001-6000	610-1830	42	0.0935	2.4	2	M403017	134,320
		6001-8000	1831-2440	43	0.0890	2.3		M406184	110,960
		8001-10,000	2441-3050	44	0.0860	2.2		M401011	99,280
		2001 – 4000	610 – 1220	15	0.1800	4.6	2	M411511	183,000
T45	Natural Gas	4001 – 6000	1221 – 1830	17	0.1730	4.4		M411374	168,400
		6001 – 8000	1831 – 2440	18	0.1695	4.3		M402988	155,000
		8001 – 10000	2441 – 3050	20	0.1610	4.1		M401002	142,600
	L.P. Gas	2001 – 4000	610 – 1220	36	0.1065	2.7		M402487	183,000
		4001 – 6000	1221 – 1830	37	0.1040	2.6		M411375	168,400
		6001 – 8000	1831 – 2440	38	0.1015	2.6		M411376	155,000
		8001 – 10000	2441 – 3050	40	0.0980	2.5		M406361	142,600

* Btu/hr. derate of 4% per 1000 feet (305 meters) of altitude.

Table 8

Electrical Requirements

	WARNING
	<p>To reduce the risk of electric shock, fire, explosion, serious injury or death:</p> <ul style="list-style-type: none">• Disconnect electric power to the tumbler before servicing.• Close gas shut-off valve to gas tumbler before servicing.• Close steam valve to steam tumbler before servicing.• Never start the tumbler with any guards/ panels removed.• Whenever ground wires are removed during servicing, these ground wires must be reconnected to ensure that the tumbler is properly grounded.
	<p>To reduce the risk of fire and electric shock, check with a qualified serviceman for proper grounding procedures. Improper connection of the equipment grounding conductor may result in a risk of electric shock.</p>
	<p>To reduce the risk of fire and electric shock, if electrical supply is coming from a three phase service, DO NOT connect a "High Leg" or "Stinger Leg" to a single phase machine. On a three phase machine, if there is a "High Leg" or "Stinger Leg" it should be connected to L3.</p>

Grounding Instructions

NOTE: To ensure protection against shock, this tumbler MUST be electrically grounded in accordance with the local codes, or in the absence of local codes, with the latest edition of the National Electrical Code ANSI/NFPA No. 70. In Canada the electrical connections are to be made in accordance with CSA C22.1 latest edition Canadian Electrical Code, or local codes.

This tumbler must be grounded. In the event of malfunction or breakdown, grounding will reduce the risk of electric shock by providing a path of least resistance for electric current. This tumbler must be connected to a grounded metal, permanent wiring system; or an equipment grounding conductor must be run with the circuit conductors and connected to the appropriate ground location.

- Metal conduit and/or BX cable is not considered ground.
- Connecting the Neutral from the electrical service box to the tumbler ground screw does not constitute a ground.
- A dedicated ground conduit (wire) must be connected between the electrical service box ground bar and tumbler ground screw.

	WARNING
	<p>To reduce the risk of electrical shock, de-energize the electrical circuit being connected to the tumbler before making any electrical connections. All electrical connections should be made by a qualified electrician. Never attempt to connect a live circuit.</p>

W409

	CAUTION
	<p>Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.</p>

W071

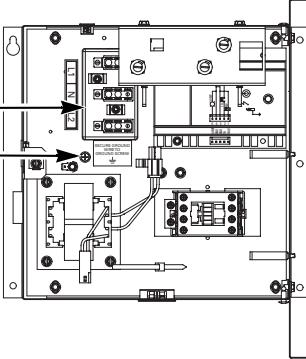
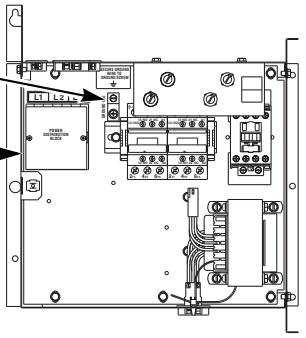
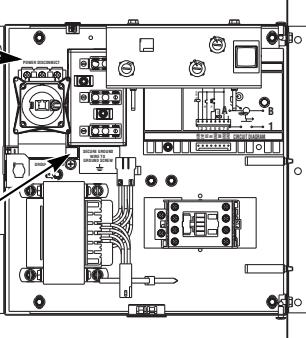
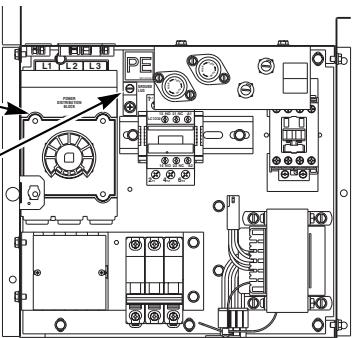
For CE Models Only

All manually operated models are factory-equipped with an emergency stop button on the front panel. If the emergency stop function is desired on coin-operated models, an external emergency stop button may be installed as specified on the machine wiring diagram.

NOTE: Activation of the emergency stop button stops all machine control circuit functions, but DOES NOT remove all electrical power from machine.

Electrical Requirements

Service/Ground Location

Model	Heat Source	Ground and Terminal Block Locations
T30/T45 Non-CE	T30: Gas or Steam T45: Gas	 <p>Terminal Block</p> <p>Ground Screw</p> <p>TMB2041N</p>
T30 Non-CE	Electric	 <p>Ground Lug</p> <p>Power Distribution Block</p> <p>TMB2113N</p>
T30/T45 CE	T30: Gas or Steam T45: Gas	 <p>Power Disconnect</p> <p>Ground Screw</p> <p>TMB2114N</p>
T30 CE	Electric	 <p>Power Distribution Block</p> <p>Ground Lug</p> <p>TMB2115N</p>

Connecting Electrical Service

The following steps outline the procedure for connecting electrical service to the tumbler.

- **3 Phase models – Each tumbler must be connected to its own individual branch circuit breaker, not fuses, to avoid the possibility of “single phasing” and causing premature failure of the motor(s).**
- **Electrical service must be connected using the appropriate permanent rigid metal conduit system.**
- **Service conductors must be copper only.**

For an existing service, determine your service voltage and conductor amperage. Carefully review the tumbler serial plate ratings and **Electrical Requirements** section of this manual. If service is inadequate it must be upgraded by a qualified electrical contractor. Never connect an improper or inadequate service to any machine.

Configuring Your Tumbler for Other Service Voltages

Several gas and steam tumbler models have been designed to be field convertible to other service voltages. Refer to *Table 9* for these models:

Models	If your Serial Plate voltage is:	Your tumbler can be converted to the following voltages:
T30	120 Volt/60 Hertz/ 1 Phase	208-240 Volt/60 Hertz/ 1 Phase
T30	200-220 Volt/60 Hertz/ 1 Phase	100 Volt/60 Hertz/ 1 Phase
T30	200 Volt/50 Hertz/ 1 Phase	100 Volt/50 Hertz/ 1 Phase
T30/ T45	240 Volt/60 Hertz/ 3 Phase	200-208 Volt/60 Hertz/ 3 Phase
T30	380 Volt/50 Hertz/ 3 Phase	400-415 Volt/50 Hertz/ 3 Phase

Table 9

NOTE: Electric models are not field convertible and must be connected to service specified on serial plate.

If tumbler requires conversion for use on another service voltage, complete the steps detailed in the **Conversion Instructions** section **prior to connecting service to machine**.

If tumbler does not require conversion or has been converted according to the **Conversion Instructions** section of this manual, continue with step 1.

NOTE: The wiring diagram is located in the upper junction box or upper contactor box.

1. For new service, install a circuit breaker or fused disconnect of proper voltage and current rating as close to each tumbler as possible.
2. Route service conduit from circuit breaker panel or disconnect panel to tumbler service connection box. Conduit routing should not obstruct access for maintenance or servicing. Refer to **Service/Ground Location**.
3. Pull conductors through conduit and attach to circuit breaker and ground connection. Secure service ground wire to the grounding screw or lug. Attach service conductors to appropriately labeled positions on the terminal block. Make sure all connections are secure.
4. Check electrical service phase sequence (3 Phase models only) as follows:
 - a. Energize the electrical service and momentarily start the tumbler. Check the direction of cylinder rotation. If the cylinder rotates clockwise as viewed from the front, the phase sequence is correct. If the cylinder rotates counterclockwise, proceed with step b.
 - b. Disconnect power to machine, disconnect and reverse the L1 and L2 connections on the terminal block.

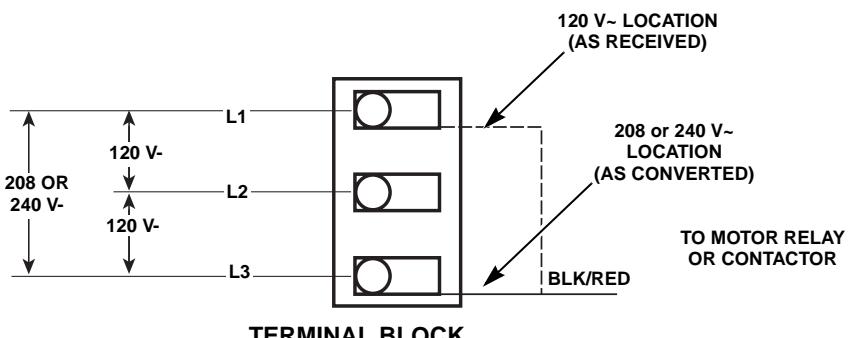
Electrical Connections

All gas and steam tumblers require a single service connection to TB1 of the upper unit junction box only. The serial plate reflects current draw, breaker/fuse size and conductor amperage required for the entire machine.

All electric tumblers require separate service connections for each upper and lower unit. Serial Plate ratings reflect current draw, breaker/fuse size and conductor amperage required per unit.

Electrical Requirements

Conversion Instructions

If serial plate voltage is:	Tumbler can be converted to the following voltages:
120 Volt/60 Hertz/ 1 Phase 2W&G (T30 Models Only)	<p>208-240 Volt/60 Hertz/1 Phase Models: 3W&G</p> <ol style="list-style-type: none"> Prior to connecting service, locate the black/red wire which runs between terminal block and the motor relay or contactor. Refer to figure below.  <p style="text-align: right;">T381I</p> <ol style="list-style-type: none"> Disconnect the black/red lead from L1 of the terminal block and connect to L2 of the terminal block. Repeat steps 1 and 2 for upper and lower junction box areas. Sign and date conversion sticker located on back of tumbler. Follow the instructions covered in <i>Connecting Electrical Service</i> section.
240 Volt/60 Hertz/ 3 Phase 3W&G	<p>200-208 Volt/60 Hertz/3 Phase Models: 3W&G</p> <ol style="list-style-type: none"> Prior to connecting electric service, locate transformer configuration jumper in junction box area. Remove the 240 Volt jumper and replace it with the 208 Volt jumper located in the literature packet in cylinder. Repeat steps 1 and 2 for each upper and lower unit. Sign and date conversion sticker located on back of tumbler. Follow the instructions covered in <i>Connecting Electrical Service</i> section.

If serial plate voltage is:	Tumbler can be converted to the following voltages:
200-220 Volt/60 Hertz/ 1 Phase 2W&G 200 Volt/50 Hertz/ 1 Phase 2W&G (T30 Models Only)	100 Volt/60 Hertz/1 Phase INTERNATIONAL Models: 2W&G 100 Volt/50 Hertz/1 Phase INTERNATIONAL Models: 2W&G <ol style="list-style-type: none"> 1. Prior to connecting electric service, locate transformer configuration jumper in junction box area. 2. Remove the 208 Volt jumper and replace it with the 100 Volt jumper located in the literature packet from cylinder. 3. Remove small access cover from back of the fan motor. Locate the two internal jumper wires, brown and blue connected to motor terminals #6 and #2. Move brown wire from terminal #6 to terminal #2 and blue wire from terminal #2 to terminal #4. Be careful not to confuse light blue motor harness wire with the dark blue internal jumper. 4. Carefully check motor wire connections with wiring diagram and verify that the motors are configured for low voltage operation before replacing covers. 5. Repeat steps 1 through 4 for each upper and lower unit. 6. Sign and date conversion sticker located on back of tumbler. 7. Follow the instructions covered in <i>Connecting Electrical Service</i> section.
380 Volt/50 Hertz/ 3 Phase 3W&G (T30 Models Only)	400-415 Volt/50 Hertz/3 Phase Models: 3W&G <ol style="list-style-type: none"> 1. Prior to connecting electric service, locate transformer configuration jumper in junction box area. 2. Remove the 380 Volt jumper and replace it with the 415 Volt jumper located in the literature packet from cylinder. 3. Repeat steps 1 and 2 for each upper and lower unit. 4. Sign and date conversion sticker located on back of tumbler. 5. Follow the instructions covered in <i>Connecting Electrical Service</i> section.

Electrical Requirements

Electrical Requirements for Gas and Steam Models

Refer to *Table 10* and *Table 11*.

NOTE: Minimum wire sizes are obtained from Canadian Electrical Code for 75°C Conductors and are intended for use as a guideline only. Electrical connections should be made only by a qualified electrical contractor in accordance with all applicable local and national requirements.

For T30 Gas and Steam Models

(For Total Machine):

Serial Plate Voltage	Terminal Block Connections Required	Current (Amps)	Recommended Fuse or Breaker Rating (Amps)	Breaker Poles	Recommended Minimum Conductor Size [AWG (mm ²)]
120V/60 Hz/1ph	L1, Neutral, and ground	16.0	20	1	12 (3.31)
208-240V/60Hz/1ph	L1, L2, Neutral, and ground	8.0	10	2	14 (2.08)
100V/60Hz/1ph	L1, Neutral, and ground	22.0	30	1	10 (5.26)
200-220V/60Hz/1ph	L1, Neutral, and ground	11.6	15	1	14 (2.08)
100V/50Hz/1ph	L1, Neutral, and ground	24.2	35	1	8 (8.37)
200V/50Hz/1ph	L1, Neutral, and ground	15.0	20	1	12 (3.31)
230-240V/50Hz/1ph	L1, Neutral, and ground	15.0	20	1	12 (3.31)
200-208V/60Hz/3ph	L1, L2, L3, and ground	6.4	10*	3	14 (2.08)
240V/60Hz/3ph	L1, L2, L3, and ground	6.4	10*	3	14 (2.08)
200V/50Hz/3ph	L1, L2, L3, and ground	5.8	10*	3	14 (2.08)
230-240V/50Hz/3ph	L1, L2, L3, and ground	7.0	10*	3	14 (2.08)
380V/50 or 60Hz/3ph	L1, L2, L3, and ground	3.0	10*	3	14 (2.08)
400-415V/50Hz/3ph	L1, L2, L3, and ground	3.2	10*	3	14 (2.08)
460-480V/60Hz/3ph	L1, L2, L3, and ground	3.3	10*	3	14 (2.08)

* 3 Phase machines should not have fuses, breakers only.

Table 10

NOTE: Electrical specifications below are subject to change without notice. Always refer to product serial plate for most current specifications of product being installed.

NOTE: Use copper conductors only.

NOTE: 3 Phase Only – Each tumbler must be connected to its own individual branch circuit breaker, not fuses, to avoid the possibility of “single phasing” and causing premature failure of the motor(s).

For T45 Gas Models (For Total Machine):

Serial Plate Voltage	Terminal Block Connections Required	Current (Amps)	Recommended Fuse or Breaker Rating (Amps)	Breaker Poles	Recommended Minimum Conductor Size (AWG [mm ²])
208–240V/60Hz/1ph	L1, L2, Neutral and ground	12.0	15	2	14 (2.08)
200–208V/60Hz/3ph	L1, L2, L3 and ground	9.6	15	3	14 (2.08)
240V/60Hz/3ph	L1, L2, L3 and ground	9.6	15	3	14 (2.08)
200V/50Hz/1ph	L1, Neutral and ground	11.2	15	1	14 (2.08)
230–240V/50Hz/1ph	L1, Neutral and ground	10.8	15	1	14 (2.08)

Table 11

Electrical Requirements

Electrical Requirements for Electric Models

Refer to *Table 12*.

NOTE: Minimum wire sizes are obtained from Canadian Electrical Code for 75°C Conductors and are intended for use as a guideline only. Electrical connections should be made only by a qualified electrical contractor in accordance with all applicable local and national requirements.

For 21 kW T30 Electric Models:

Serial Plate Voltage	Terminal Block Connections Required	Current (Amps)	Recommended Breaker Rating (Amps)	Breaker Poles	Recommended Minimum Conductor Size [AWG (mm ²)]
200-208V/60Hz/3ph*	L1, L2, L3, and ground	62**	80	3	4 (21.2)
200V/50Hz/3ph*	L1, L2, L3, and ground	60**	80	3	4 (21.2)
230-240V/50Hz/3ph*	L1, L2, L3, and ground	55**	70	3	4 (21.2)
240V/60Hz/3ph*	L1, L2, L3, and ground	54**	70	3	4 (21.2)
380V/50 or 60Hz/3ph*	L1, L2, L3, and ground	33**	45	3	8 (8.37)
400-415V/50Hz/3ph*	L1, L2, L3, and ground	31**	40	3	8 (8.37)
460-480V/60Hz/3ph*	L1, L2, L3, and ground	27**	35	3	8 (8.37)

* These serial plate voltages are only options available on the T30 electric models. Current (Amp) is for one pocket only.

** Per heater on T30 electric models, each has two heaters.

NOTE: Electrical specifications below are subject to change without notice. Always refer to product serial plate for most current specifications of product being installed.

NOTE: Connect to individual branch circuit.

NOTE: 3 Phase Only – Each tumbler must be connected to its own individual branch circuit breaker, not fuses, to avoid the possibility of “single phasing” and causing premature failure of the motor(s).

Table 12

Steam Requirements

NOTE: Machines require a constant 80 to 100 psig (5.62 to 7.03 kg/sq. cm) steam service for optimum operation. The maximum allowable steam pressure for use with 60 Hertz or 50 Hertz tumblers is 125 psig (8.6 bar). In no case may the pressure exceed the above value.

Obtain specific steam service pipe sizes from the steam system supplier or a qualified steam fitter.

- Refer to *Figure 15* for proper steam pipe configurations.
- To prevent condensate draining from headers to tumbler, piping should have a minimum 12 inch (305 mm) rise above respective header. Do not make steam connection to header with a horizontal or downward facing tee or elbow.
- Whenever possible, horizontal runs of steam lines must drain, by gravity, to respective steam header. Water pockets, or an improperly drained steam header, will provide wet steam, causing improper operation of tumbler. If pockets or improper drainage cannot be eliminated, install a bypass trap to drain condensate from the low point in the steam header to the return.
- In both steam supply and steam return line, it is recommended that each have a pipe union and shut-off valve. This will enable you to disconnect the steam connections and service the tumbler while your laundry facility is in operation.
- Connect the steam solenoid valve to the related steam coil inlet connection with nipples, flex hoses, unions and tee.
- Strainers may require cleaning due to materials from hoses or pipes.
- Install vacuum breaker (optional), bucket trap with built-in strainer and check valve. For successful operation of tumbler, install trap 18 inches (457 mm) below coil and as near to the tumbler as possible. Inspect trap carefully for inlet and outlet markings and install according to trap manufacturer's instructions. If steam is gravity returned to boiler, omit trap but install optional vacuum breaker and check valve in return line near tumbler. Gravity return requires entire return plumbing be below steam coil outlet.
- Install union and shut-off valve in return line and make final pipe connections to return header.

NOTE: To prevent water hammering, route return lines below outlets of steam coils.

Piping Recommendations

- Trap each steam coil individually. Always keep the trap clean and in good working condition.
- When tumbler is on the end of a line of equipment, extend header at least 4 feet (1.2 meters) beyond tumbler. Install shut-off valve, union, check valve and bypass trap at end of line. If gravity return to boiler, omit trap.
- Insulate steam supply and return line for safety of operator and safety while servicing tumbler.
- Keep tumbler in good working condition. Repair or replace any worn or defective parts.

	WARNING
<p>All system components must have a 125 psig (8.6 bar) working pressure. Shut-off valves must be installed upstream of the steam solenoid valve and downstream of each steam trap so components can be isolated for maintenance or emergency purposes.</p> <p>All components (solenoid valve, traps) must be supported to minimize loads on the tumbler steam coil connections.</p>	

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Installing Steam Trap and Making Condensate Return Connections

The steam trap must be installed and the coil outlet connections must be connected to the condensate return lines. The following steps outline the procedure for installing the steam trap and connecting the condensate return lines. Refer to *Figure 15* for typical installations.

1. Use flexible lines between steam inlet solenoid and steam coils, as well as outlet between steam coil and traps.
2. If necessary, install a strainer at the end of each flexible hose.
3. Install a steam trap to each strainer.

IMPORTANT: Steam trap must be installed a minimum of 18 inches (457 mm) below the steam coil outlet connections.

4. Install a shut-off valve to each steam trap.
5. Connect to the condensate return lines.
6. For steam solenoid valve wiring connections, refer to Wiring Diagram supplied with tumbler.



WARNING

The flexible steam hoses connecting the coil outlet connections and steam traps must have a minimum of 125 psig (pounds per square inch gauge) (8.79 kg/sq. cm.) working pressure. A shut-off valve must be installed downstream from each steam trap so the condensate return line can be isolated in event a steam trap requires maintenance.

Each steam trap must be supported so minimum load is exerted on the coil outlet connection.

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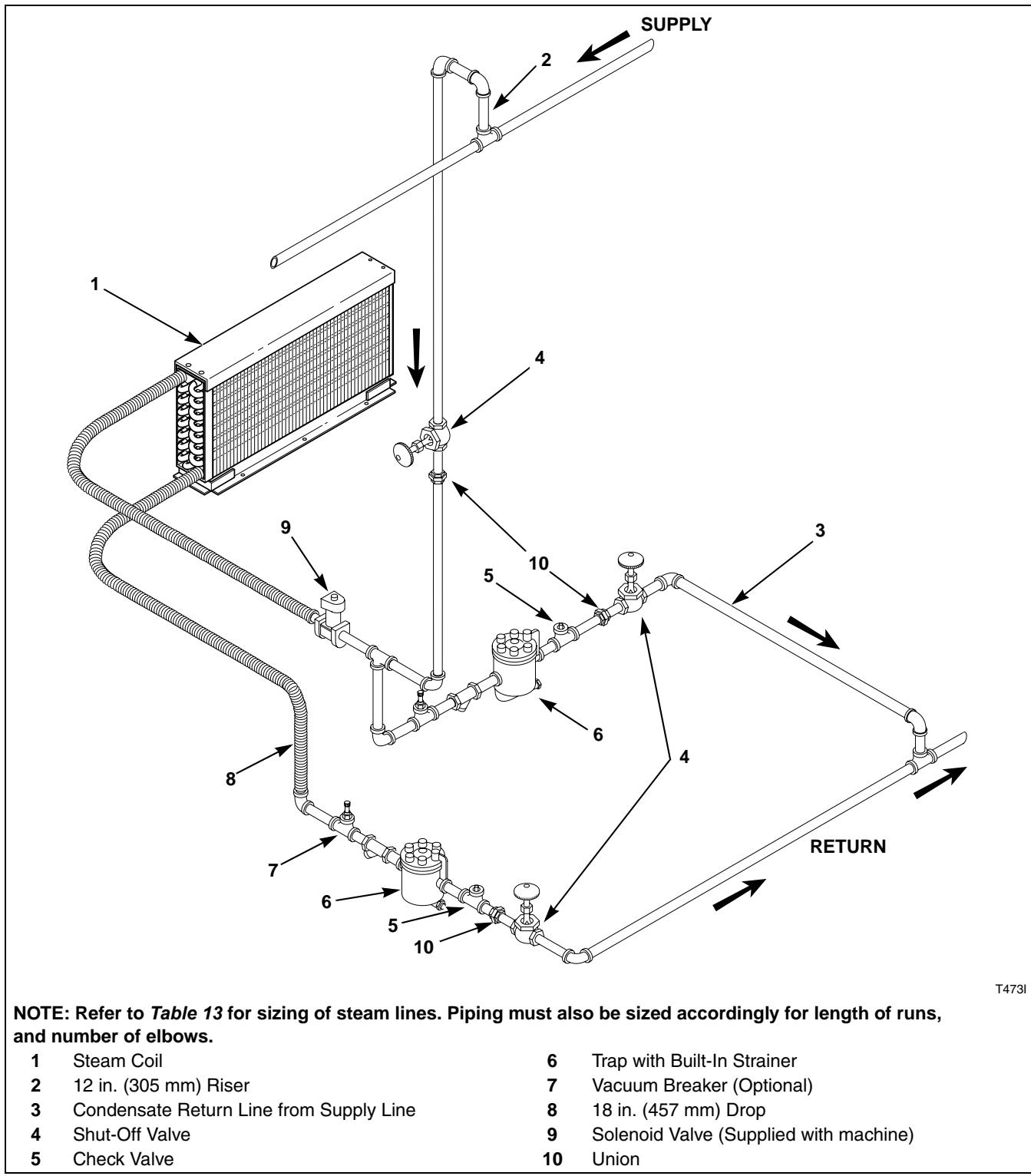


Figure 15

Model	Steam Pressure PSI (bar)	Minimum Pipe Diameter	Steam Trap Size* (Pounds Condensate/Hour)
T30	15-100 (1-6.9)	3/4 in. NPT	110

*Based on 100 psi.

Table 13

Single Drop Timer

NOTE: The following information is for models with an SD control suffix only.

Power-Up Mode

When power is applied to the tumbler, the *IN USE* light flashes factory status information. Following this, the control goes into READY Mode (light off) or RUN Mode if power was interrupted during a cycle (light on, time remaining unchanged).

Ready Mode

In READY Mode (light off), the control waits for the vend to be satisfied. When vend is satisfied the control goes into START Mode.

Start Mode

In START Mode (light on), the vend has been satisfied but the start button has not been pressed. Time remaining in the cycle will not change until the start button is pressed. When the start button is pressed the machine goes into RUN Mode.

Run Mode

In RUN Mode (light on), the machine is running a cycle and the time remaining is counting down. When time remaining counts down to zero, the control goes into READY Mode.

Setting Dry Time Dipswitches

To change the dry time on the tumbler, combinations of dipswitches can be set on the control.

There are eight dipswitches on the tumbler control. The first six switches are used to program the amount of additional heat time given for each coin pulse. The additional drying time is added to the factory default minimum heat time of one minute. A value of 1 to 64 minutes of additional drying time is available for each coin drop pulse.

The last two switches are used to program the amount of additional cool down time. The additional cool down time is added to the factory default minimum cool down time of 1 minute. A value of 1 to 3 additional minutes is available. The control is shipped from the factory programmed with 1 minute of minimum heat time, preset with 7 additional minutes of drying time (dipswitches 1, 2 and 3 in ON position) and 1 minute of minimum cool down time for a total time of 9 minutes for a coin pulse. For dipswitch settings refer to *Table 14*.

The control reads the dipswitch settings at power-up. The control must be powered down to change the dipswitch settings.

To change the time for a coin pulse, the desired dry time dipswitches must be set to ON position. All other dipswitches must be in OFF position.

Dipswitch Settings

Heat Time Per Coin Pulse (in Minutes)	Heat Switch Number						Cool Down Switch Number	Cool Down Per Cycle (in Minutes)
	1	2	3	4	5	6		
1	OFF	OFF	OFF	OFF	OFF	OFF	OFF	1 (factory default)
2	ON	OFF	OFF	OFF	OFF	OFF	ON	2
3	OFF	ON	OFF	OFF	OFF	OFF	OFF	3
4	ON	ON	OFF	OFF	OFF	OFF	ON	4
5	OFF	OFF	ON	OFF	OFF	OFF	OFF	
6	ON	OFF	ON	OFF	OFF	OFF	OFF	
7	OFF	ON	ON	OFF	OFF	OFF	OFF	
8 (factory default)	ON	ON	ON	OFF	OFF	OFF	OFF	
9	OFF	OFF	OFF	ON	OFF	OFF	OFF	
10	ON	OFF	OFF	ON	OFF	OFF	OFF	
11	OFF	ON	OFF	ON	OFF	OFF	OFF	
12	ON	ON	OFF	ON	OFF	OFF	OFF	
13	OFF	OFF	ON	ON	OFF	OFF	OFF	
14	ON	OFF	ON	ON	OFF	OFF	OFF	
15	OFF	ON	ON	ON	OFF	OFF	OFF	
16	ON	ON	ON	ON	OFF	OFF	OFF	
17	OFF	OFF	OFF	OFF	ON	OFF	OFF	
18	ON	OFF	OFF	OFF	ON	OFF	OFF	
19	OFF	ON	OFF	OFF	ON	OFF	OFF	
20	ON	ON	OFF	OFF	ON	OFF	OFF	
21	OFF	OFF	ON	OFF	ON	OFF	OFF	
22	ON	OFF	ON	OFF	ON	OFF	OFF	
23	OFF	ON	ON	OFF	ON	OFF	OFF	
24	ON	ON	ON	OFF	ON	OFF	OFF	
25	OFF	OFF	OFF	ON	ON	OFF	OFF	
26	ON	OFF	OFF	ON	ON	OFF	OFF	
27	OFF	ON	OFF	ON	ON	OFF	OFF	
28	ON	ON	OFF	ON	ON	OFF	OFF	
29	OFF	OFF	ON	ON	ON	OFF	OFF	
30	ON	OFF	ON	ON	ON	OFF	OFF	
31	OFF	ON	ON	ON	ON	OFF	OFF	
32	ON	ON	ON	ON	ON	OFF	OFF	
33	OFF	OFF	OFF	OFF	OFF	ON	OFF	
34	ON	OFF	OFF	OFF	OFF	ON	OFF	
35	OFF	ON	OFF	OFF	OFF	ON	OFF	

Table 14 (Continued)

Single Drop Timer

Table 14 (Continued)

Heat Time Per Coin Pulse (in Minutes)	Heat Switch Number					
	1	2	3	4	5	6
36	ON	ON	OFF	OFF	OFF	ON
37	OFF	OFF	ON	OFF	OFF	ON
38	ON	OFF	ON	OFF	OFF	ON
39	OFF	ON	ON	OFF	OFF	ON
40	ON	ON	ON	OFF	OFF	ON
41	OFF	OFF	OFF	ON	OFF	ON
42	ON	OFF	OFF	ON	OFF	ON
43	OFF	ON	OFF	ON	OFF	ON
44	ON	ON	OFF	ON	OFF	ON
45	OFF	OFF	ON	ON	OFF	ON
46	ON	OFF	ON	ON	OFF	ON
47	OFF	ON	ON	ON	OFF	ON
48	ON	ON	ON	ON	OFF	ON
49	OFF	OFF	OFF	OFF	ON	ON
50	ON	OFF	OFF	OFF	ON	ON
51	OFF	ON	OFF	OFF	ON	ON
52	ON	ON	OFF	OFF	ON	ON
53	OFF	OFF	ON	OFF	ON	ON
54	ON	OFF	ON	OFF	ON	ON
55	OFF	ON	ON	OFF	ON	ON
56	ON	ON	ON	OFF	ON	ON
57	OFF	OFF	OFF	ON	ON	ON
58	ON	OFF	OFF	ON	ON	ON
59	OFF	ON	OFF	ON	ON	ON
60	ON	ON	OFF	ON	ON	ON
61	OFF	OFF	ON	ON	ON	ON
62	ON	OFF	ON	ON	ON	ON
63	OFF	ON	ON	ON	ON	ON
64	ON	ON	ON	ON	ON	ON

Total Cycle Time = Heat Time + Cool Down Time

Table 14

Adjustments

Loading Door Switch

The door switch should be adjusted so the cylinder stops when door is opened 2 inches (51 mm) plus or minus 0.25 inch (6 mm). This switch is a normally open switch and is closed by the hinge cam when the door is closed. If adjustment is required, refer to *Figure 16* and proceed as follows:

1. Close door and start tumbler, slowly open loading door. Cylinder and heat system should shut off when door is open 2 inches (51 mm) plus or minus 0.25 inch (6 mm).
2. Slowly close the loading door. When door is 2 inches (51 mm) from being fully closed, the door switch actuating bracket (located on the door) should depress the button and the switch arm with an audible “click.”
3. If the actuating bracket does not operate the switch at the appropriate door closure, bend the actuating switch bracket in or out to achieve proper actuation.

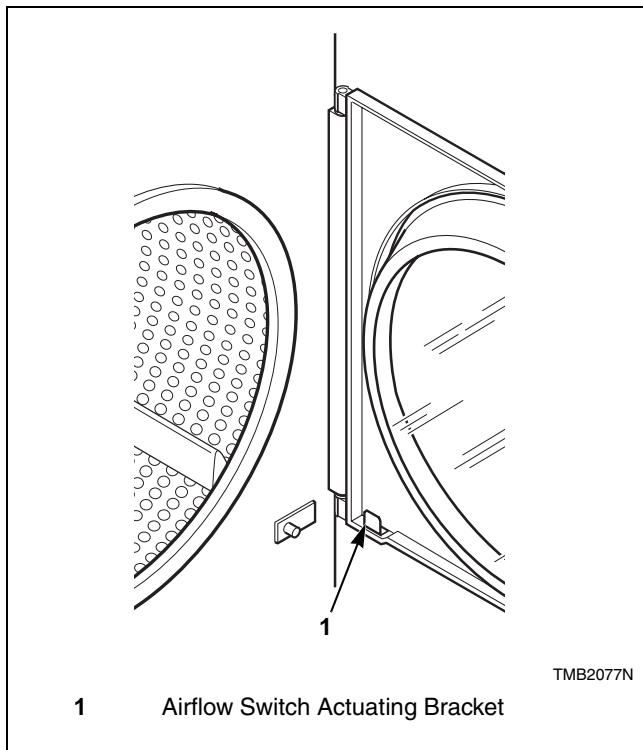
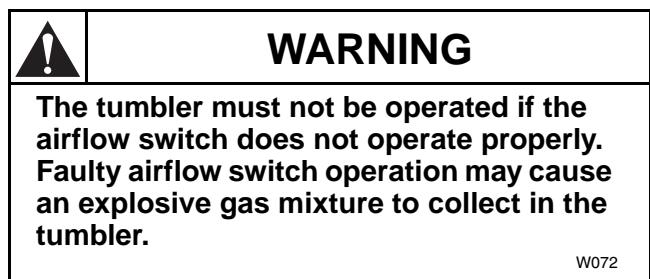


Figure 16

Airflow Switch

The airflow switch is set at the factory for proper operation. No adjustment necessary.

The airflow switch operation may be affected by shipping tape still in place, lack of make-up air, or an obstruction in the exhaust duct. These should be checked and the required corrective action taken.



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IMPORTANT: Airflow switch vane must remain closed during operation. If it opens and closes during the drying cycle, this indicates insufficient airflow through the tumbler. If switch remains open, or pops open and closed during the cycle, the heating system will shut off. The cylinder and fan will continue to operate even though the airflow switch is indicating insufficient airflow.

NOTE: To properly mount the airflow switch bracket, or in case of a load not drying, the airflow switch bracket may need to be checked for proper alignment. Be sure the locator pins are securely in their respective holes before tightening the bracket mounting screws. This will assure proper alignment of the airflow switch arm in the channel of the airflow switch bracket and prevent binding of the arm.

Adjustments

Door Strike

The door strike must be adjusted to have sufficient tension to hold loading door closed against force of the load tumbling against it. There is proper adjustment of pull force when 8 to 15 pounds (35.6 N – 66.7 N) is required to open door.

If adjustment is required, refer to *Figure 17* and proceed as follows:

To adjust, open door, loosen acorn nut, and turn door strike screw in or out as required. Retighten acorn nut.

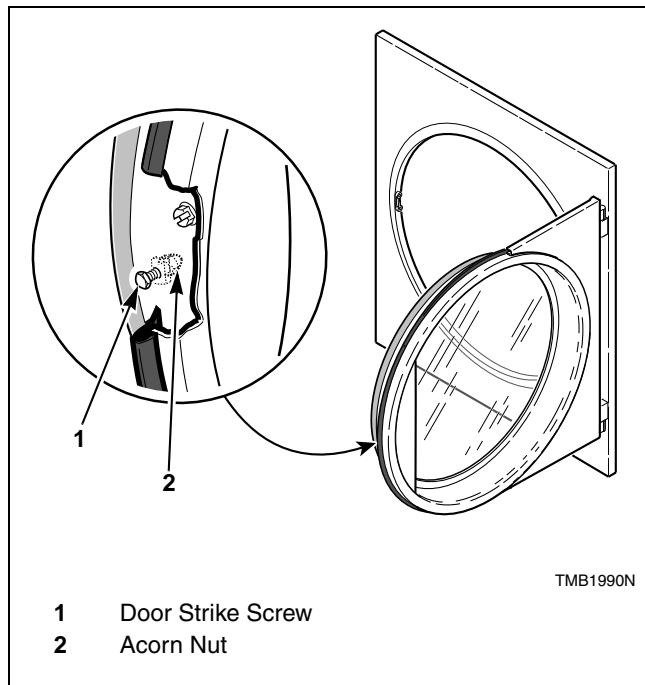


Figure 17

Removing Tumbler from Service

If the tumbler is to be removed from service, perform the following steps where applicable:

- Turn off electrical supply external to machine.
- Turn off electrical disconnect on machine.
- Turn off gas supply external to machine.
- Turn off manual gas shut-off valve on machine.
- Turn off steam supply external to machine.
- Remove all electric, gas and steam connections